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Australian Personal Computer

FEBRUARY 2001

AUSTRALIA'S LEADING TECHNOLOGY MAGAZINE

Electric Screens

Your total digital video guide

DOT COM DEBACLES

**WHY ONLINE
BUSINESSES ARE
BITING THE DUST**

NOTEBOOK WARS

**Can Vaio and iBook
make the grade?**

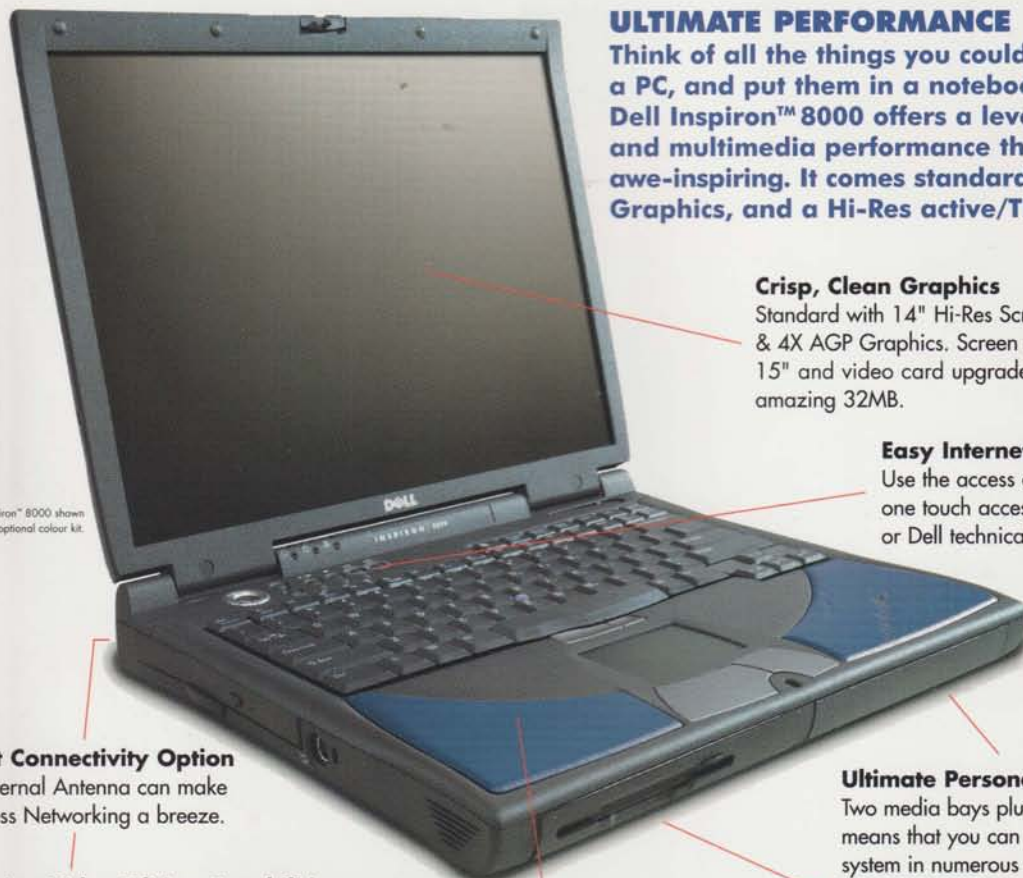
MYTHING YOU ALREADY

**Technology's urban
legends exposed**

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OUR THINKING INSIDE THE BOX



Dell Inspiron™ 8000 shown with optional colour kit.

ULTIMATE PERFORMANCE

Think of all the things you could ever want in a PC, and put them in a notebook. The new Dell Inspiron™ 8000 offers a level of power and multimedia performance that is truly awe-inspiring. It comes standard with 4X AGP Graphics, and a Hi-Res active/TFT screen.

Crisp, Clean Graphics

Standard with 14" Hi-Res Screen (1400x1050) & 4X AGP Graphics. Screen upgradeable to 15" and video card upgradeable to an amazing 32MB.

Easy Internet Access

Use the access direct buttons for one touch access to the Internet or Dell technical support.

Great Connectivity Option

The internal Antenna can make Wireless Networking a breeze.

Amazing Video Editing Capabilities

Integrated Firewire port for hot-pluggable high speed data transfer. Lets you easily download and edit digital videos and photos.

Great Looks

Optional Colour 'snap-on' kit for palm rests. Choose from Storm Grey, Tahoe Blue, Purple, or Yellow.



Ultimate Personalisation

Two media bays plus one fixed bay means that you can configure your system in numerous ways. The fixed bay supports a CDROM, a DVD or a CDRW. The configurable media bay supports a CDROM, a DVD, CDRW, second battery, a zip drive or a floppy drive. How will you configure yours?

Dell recommends Windows® 2000 Professional for business.

DELL INSPIRON™ 8000 G700VT NOTEBOOK

- Mobile Intel® Pentium® III Processor 700MHz
- 64MB SDRAM
- 5.0GB 1 HDD
- 8MB ATI MOBILITY M4, 4X AGP Video
- High-fidelity Audio SoundBlaster Compatible
- 8X DVD-ROM
- 15" Hi-Res SXGA Screen (1400x1050)

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- Microsoft™ OEM Works Suite 2000
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- Case
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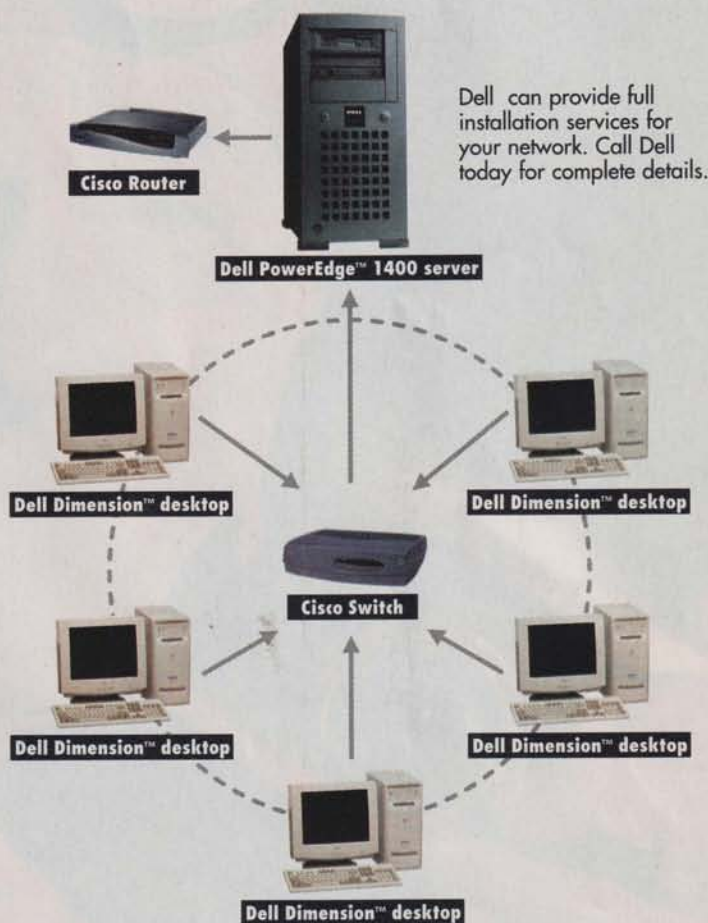
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- Creative Labs SoundBlaster 64Voice PCI Sound Card
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- 8X DVD-ROM
- 56K Modem
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- Microsoft OEM Works Suite 2000
- 1 Year Limited Warranty (Next Business Day On-Site² Response with International Coverage³)

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- 8X DVD-ROM
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- Integrated Dual ATA-100 EIDE Controller
- 48X Max Variable EIDE CD-ROM Drive
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- Microsoft® Windows 2000
- 3-Year Limited Warranty (with 3-Year Next Business Day On-Site² Service)

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NOTHING LEFT TO THINK ABOUT

PINNACLE OF POWER



Pictured with optional 19" Monitor and Altec Lansing ADA-885 Speakers with Subwoofer

The Dell Dimension™ 8100 is the next generation in PCs. Powered by the new Intel® Pentium® 4 processor – delivering speeds of 1.3 to 1.5GHz – it allows record breaking performance on graphics /multimedia intensive tasks and games. This amazing speed and performance won't be threatened by traffic bottlenecks, with the newly engineered Hyper Pipelined Technology and 400MHz System Bus with dual channel RDRAM. All starting from the equally unbelievable price of just \$2799 – which means with Dell™ you get Intel® Pentium® 4 processor power at Intel® Pentium® III processor prices!

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SUPER MODEL



Dell Inspiron™ 4000 shown with optional colour kit.

The Dell Inspiron™ 4000 gives you a choice of processor speed – up to 850MHz. Its performance is outstanding, the ATI mobility 128 Video with built in 8MB of memory delivers blazing fast 2D and 3D graphics. This is backed by up to 20GB¹ of storage space and expandable to 512MB of SDRAM. The media bay gives you the flexibility you need. Pick an optical device, a second battery, or an internal floppy disk drive. Choose your colour with an optional colour kit. All of this in a slimline 2.36kg package.

DELL INSPIRON™ 4000 G600GT NOTEBOOK

- Mobile Intel® Pentium® III Processor 600MHz featuring Intel® Speedstep™ technology
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- High-fidelity Audio SoundBlaster Compatible
- 14.1" XGA TFT Screen (1024x768)
- Microsoft® Windows® Millennium Edition
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PowerEdge™ 1400

**NEW ENTRY
SERVER**

DELL POWEREDGE™ 1400 SERVER

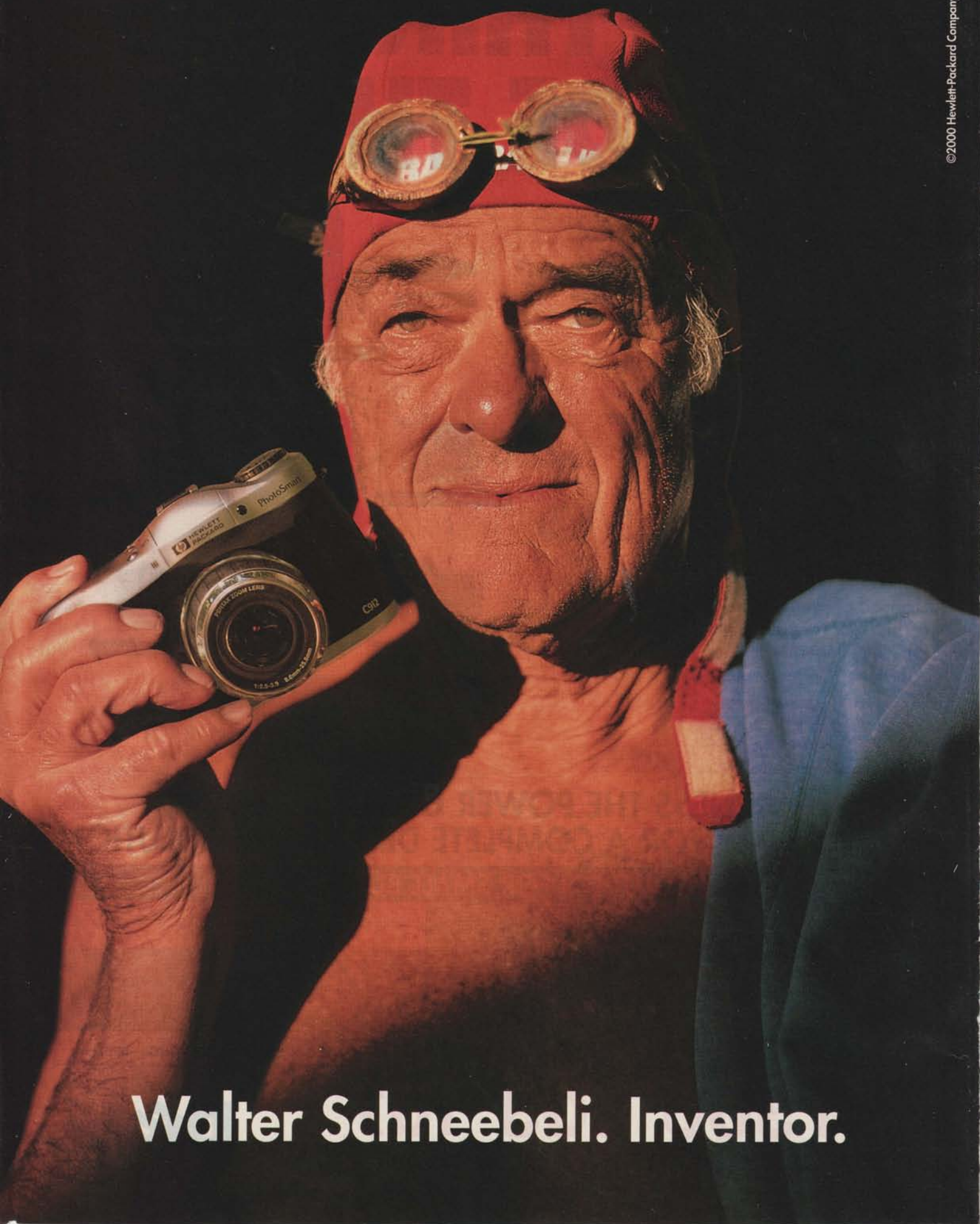
- Intel® Pentium® III Processor 800MHz (Dual Processor Capable)
- 128MB 133MHz SDRAM With ECC (Upgradeable to 2GB¹)
- 9GB¹ Ultra160 SCSI Hard Drive
- 3.5" 1.44MB Diskette Drive
- Integrated Intel® Pro 100+ NIC
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- 20/48X EIDE CD-ROM Drive
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Walter Schneeбели. Inventor.



Walt is putting together a history of nuts.
You know the type - they jump into freezing
cold lakes or rivers and call it fun.
Walt's been a member of the Dolphin Swimming
and Boating Club in San Francisco for over 50 years,
and says cold water keeps him alive.
He wants to share that feeling with the world.
So Walt's compiling a history of the club,
and uses digital photography to capture current members -
the aforementioned nuts. No film, no developing,
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For a Valentine's Day celebration with a technological flavour, check out the handy hints from our panel of romance experts

ELECTRIC SCREENS

Your total video editing guide

You've seen the TV ads with Jeff Goldblum insisting that it's easy to make your own movie with an iMac. Well, for once the hype isn't too far from the truth. Whether you're a budding professional filmmaker or you just want better than average home movies, the humble PC can handle the job. APC tells you how.



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DOT COM DEBACLES

Why online businesses are biting the dust



The Internet boom was a wild ride that paid off for investors who knew when to take their money and run. The meteoric rise of the Internet companies at the centre of this roller-coaster ride has only been matched in drama by their spectacular demise. APC traces the events surrounding the downfall of Australia's dot coms.

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NOTEBOOK WARS

Can Vaio and iBook make the grade?



If you want to escape the standard 'Intel and Windows' notebook combination, check out APC's review of two notebooks that don't fit the norm. Are these machines the way of the future, or just another pretty distraction?

In First Take 24



PIMs **Coordinating your work time and space**

If the information age has made anything clear, it's that too much information can drive you round the bend. So if you find yourself swamped with memos and Post-it notes and hopelessly behind in your work, it might be time to get yourself a personal information manager. Find out what they can do for you in APC's PIM roundup.

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MYTHING YOU ALREADY **Technology's urban legends exposed**

The IT industry is responsible for more than its fair share of urban myths — plausible-sounding stories of stupidity or woe that, all too often, simply aren't true. Gates gets generous? This message will self-destruct? Where's the ANY key? The truth is out there — and APC has found it.

**In After Hours 160**

LINUX **Inching onto corporate desktops**

Could Linux become the most popular desktop OS? Linux is being developed by an international group of programmers who want to reproduce the Linux server's success on the desktop, and it's being promoted through global grassroots activism. Is this a winning combination? APC examines the possibilities.

In Corporate 86

MOBILE PHONES **In transit**

Mobile phones are changing the face of Australia, but do we like the new look? They're transforming space and work, and have become a popular vehicle for self-expression. APC weighs up the dangers and the benefits of this increasingly popular technology.

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GST A taxing time

The GST was accompanied by all kinds of predictions — of widespread business failures, big price rises on some items and reductions on others. But what has actually happened? *APC* examines the impact the tax reform package has had on IT consumers and the computer industry.

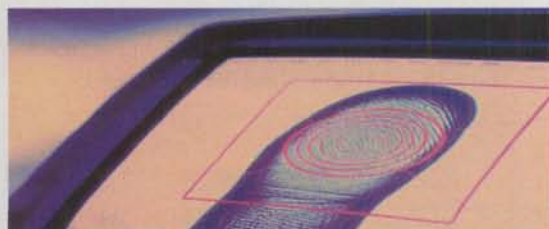


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HACKING THE BAD GUYS

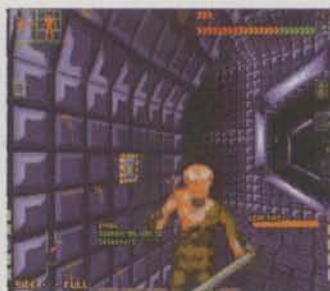
What happens when a computer is seized as part of a police investigation? Tracking digital fingerprints can be as important to modern police work as dusting for physical ones. *APC* investigates.



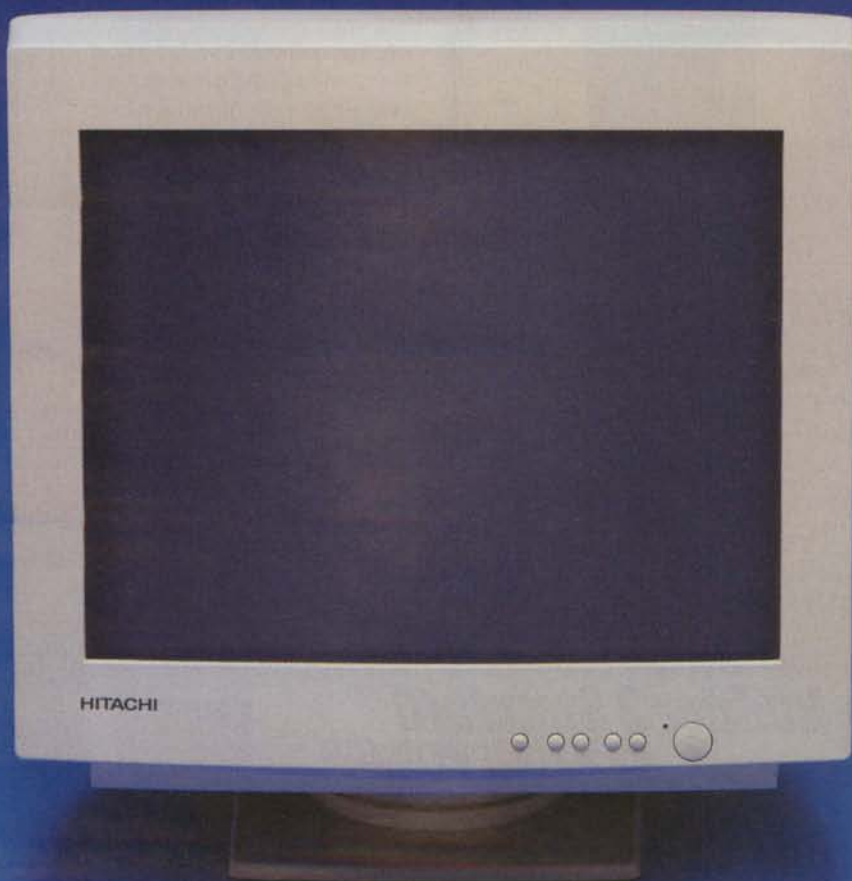
In Newswire 20

BEST EVER RPGs

RPGs are topping the gaming stakes once again. *APC* reviews the games behind this resurgence and the classics that inspired them. Revisit *Deus Ex*, *Baldur's Gate 2: Shadows of Amn*, and more.



In After Hours 158



HIGHLY SOUGHT AFTER

On the back of a year that saw sales double, Hitachi CRT monitor sales have increased another 300%*. Why the massive growth? Is it the comprehensive range? Is it the leading technology or superior quality? Is it the extensive testing which breeds reliability? Maybe it's the value for money – it must be the price. Curious? See for yourself why they really are the prize catch, call 1800 789 799 or visit www.hitachi.com.au

HITACHI
Inspire the Next

2CDs

What's hot on APC February CDs

For a complete list of programs featured on the February CDs, see the CD sleeve.

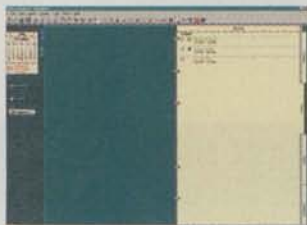
Edit? Sweet!

The selection of video editing software on CD 2 will get you set up to produce videos on your own PC. Includes: Adobe After Effects 4.1, Adobe Premiere 5.1, Digital Origin EditDV, Personal AVI Editor 1.55, SnagIt 5.10, Strata VideoShop 4.5, Ulead MediaStudio Pro 6.0, and Ulead VideoStudio 4.0.



Pim City

If your desk is always a mess and your office walls are plastered with Post-It notes, it may be time to get organised with APC's selection of shareware and trial personal information managers. Check out our PIM review on page 70.



Best ever RPGs

APC has collected a wide array of classy role-playing game demos. So dust off your sword and shield (or rifle and ammo), and get ready for some action. Read about the best ever RPGs on page 158.



For Linux lovers

The Workshop section of CD 1 includes the usual great selection of shareware, code, tips and tricks for Windows, Linux, PDAs, Mac OS and OS/2.

In this month's Linux section you'll find two great products from Caldera Systems:

Caldera Volution

This is a powerful Web-based administration tool. It allows you to maintain your entire network without the hassle of managing individual systems.



Tarantella Express

Access Linux, Unix or Windows applications over the Internet or intranet with this program. It provides secure access to applications and Web-enables existing office suites.



Borland C++ Builder 3 Standard COMPLETE VERSION

This fully integrated C++ development environment with drag-and-drop visual development allows you to easily build sophisticated C++ applications. It has over 130 reusable components including menus, dialog boxes and data visualisation flexibility.



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Trade and communicate with your customers over the Internet without having to worry about incurring enormous costs or the security of your data. It's the ideal solution for the serious small business.

Try the evaluation, then upgrade and save \$100 off the recommended retail price for readers of this month's APC.



Your guide to the cover CDs

The APC cover CDs complement the magazine and apcmag.com. Each month's disc collection features software related to articles in that issue, as well as special CD-only features and Web browsers.

Each piece of software includes instructions on whether you need to unzip the file before installing it, and most also include README files. A complete list of software on this month's discs appears on the CD cover.

The CDs were created in HTML. You do not need any special software to access them other than a standard browser. The CDs were tested using Netscape Navigator 3.0 and 4.0, and Microsoft Internet Explorer 3.0 and 4.0.

All software on the CDs is provided as is, without any warranty, express or implied. Complete terms and conditions are included on the CD; click on the Conditions of Use link for details.

How to run the CDs

Before using the CDs, please read the Conditions of Use online at apcmag.com under CDs. These CDs use an Autorun feature for Windows 95, 98 and NT systems. Just insert a cover CD and your browser will automatically load with the APC CD front page. Users of other platforms can launch their favourite browser and load the file DEFAULT.HTM in the root directory of the CD. For further information, see the instructions on the back of the CD insert.

You should carefully read the licensing agreements and honour any evaluation or shareware terms specified, read all instructions and README files, and virus check every program before use.

While APC has taken every care to ensure that the software provided is useful and that it works, we cannot accept responsibility or liability for any of the products included.

If you have any problems, refer to the Help section on the back of the CD insert.

Vendors scramble as PC sales slide

Big guns aim for boost with new strategies

2001 looks likely to be one of the toughest years yet for the PC software and hardware industry. Numerous companies are warning of declining profits, and are adopting unusual strategies in a bid to boost sales.

The end of the year usually marks one of the busiest periods for the PC industry, but despite healthy Christmas sales, one company after another has warned that sales would be down during the first half of 2001. The technology industry has become used to warnings about the volatile dot com sector's inability to meet expectations, but the recent predictions came from four very respectable companies: Apple, Compaq, Gateway and Microsoft.

At the heart of this pessimism were warnings from leading chip makers Intel and AMD that demand was flatter than expected, and that this reflected a general decline in PC sales. Contradicting analyst estimates that the company could experience growth of 8%, Intel warned that sales would be flat. The warning sent panic through the Wall Street investment community, which was already reeling from a continuing decline in technology stocks.

In a bid to stimulate new demand and increase revenue, some companies are adopting radical new approaches. Gateway has begun shipping ready-made PCs to

some of its US stores, allowing customers to take them home immediately after purchase. This is a major change in Gateway's policy. Previously, to minimise inventory requirements, PCs were only built after customers ordered them. A similar approach has been taken by Dell, and has also been adopted to varying degrees by more conventional PC manufacturers such as Compaq and IBM.

Action needed

However, more serious action is needed to stem the decline in Gateway's earnings. Like most large PC companies, Gateway doesn't see any immediate prospect of an upturn. "We expect these issues will continue to have an effect on overall demand over the next 12 to 18 months," chief financial officer John Todd said.

Microsoft is responding to changing patterns of demand in a different way. Just days after it revealed that revenue for its next quarter would be lower than expected, it announced licensing changes designed to encourage corporations to adopt Windows 2000. Microsoft had said the decline was largely due to flatter than expected sales of applications such as Office, but some analysts also pointed the finger at sales of Windows 2000, saying they had not met expectations.

Under the new changes to Microsoft's volume licensing program, which will take effect on different dates during 2001, companies will no longer be able to purchase

Windows 95, 98 or Me at discount rates for use on multiple desktops. Those rates will be reserved for Windows 2000. The change doesn't affect systems already in use, but may encourage companies upgrading their PCs to upgrade to Windows 2000 at the same time.

What's the problem?

Explanations for the decline in PC sales differ. Some analysts have cited the increasing use of non-PC devices such as handhelds and mobile phones as a reason for the shift. Others have emphasised economic uncertainty and saturation of key markets

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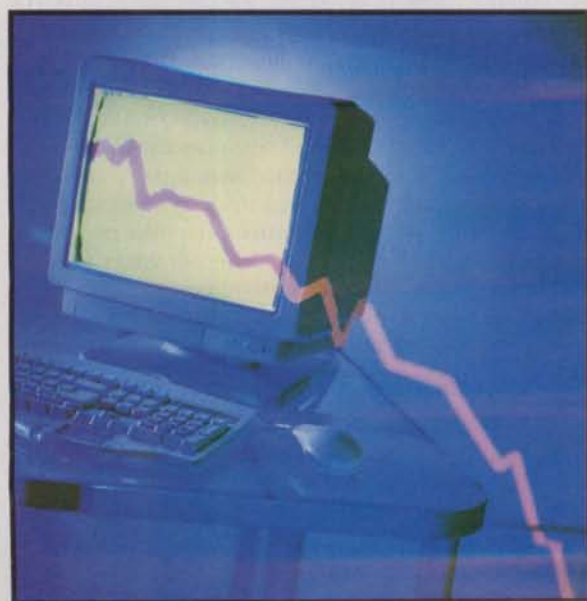
(such as the US and Australia), leaving the main growth opportunities in developing areas such as China.

With the launch of digital TV in Australia and similar services elsewhere (see APC January, page 28), some analysts believe that broadband access will become divided between PC and non-PC devices. "By 2003, broadband content will be divided sharply by device — PCs will comprise one half of all broadband devices, while TVs and game consoles will make up the other half," Forrester Research predicted in a recent study.

A number of local factors have also contributed to modest growth in the Australian PC market. Analysing third quarter results, research firm Gartner blamed disappointment on uncertainty over the GST, the Olympics and unfavourable exchange rates for the Australian dollar. "The home and SOHO (small office home office) market segments continue to exhibit healthy signs of growth and may be the key driving force in sustaining the Australian PC market," Gartner noted in a commentary on the problem.

Despite the fall in sales, there appears to be no real decline in the use of PCs. Research firm IDC predicts that 2001 will see more than 500 million PCs in use worldwide, with 75 million of them located in the Asia-Pacific region.

Angus Kidman



News roundup

NOIE names new CEO

The National Office for the Information Economy (NOIE) has snubbed acting CEO Rod Badger by appointing former public servant John Rimmer to its top job. Rimmer was the executive director of Multimedia Victoria from 1995 to 1997 and recently held a position in the private sector. IT minister Richard Alston said Rimmer's experience will ensure NOIE "continues to play a pivotal role in the development and coordination of government policy relating to the information and use of online technologies". Badger had held the position since July 2000 when then CEO Paul Twomey left the organisation six months before his contract was up.

Woolies stakes out GreenGrocer

Supermarket giant Woolworths has paid \$12 million for a 26% stake in retailer GreenGrocer.com.au. GreenGrocer now plans to add nonperishable food to its current inventory of fresh goods. "We are anticipating a good increase in customer basket size," said GreenGrocer chief executive Douglas Carlson. Woolworths's HomeShop has so far struggled to attract business, but GreenGrocer has 60,000 customers and expects to break even next year. Woolworths has pledged to retain the company's current management and business.

Priceline.com retreats from Oz

The Australian offshoot of US discount retailer Priceline.com has caved in after spending \$15 million on an unfinished Web site. The Australian franchise, called myprice.com.au, was headed by former Telstra directors Peter Shore and Frank Blount. myprice raised \$30 million from private investors such as Telstra and US businessman George Soros, who can expect to recover only half their money. Since March, myprice has been setting up a Web site to allow consumers to search for the cheapest products available online. It was planning to float on the Australian Stock Exchange.

Sport sidesteps gambling ban

The Federal Government has sunk Australia's online casinos into crisis by passing legislation banning Internet gambling. Under The Interactive Gambling (Moratorium) Act, Internet sports and horse gambling remains legal, but online casino-style gambling is banned.

The government originally sought to ban all forms of online gambling, but the Senate blocked the legislation in October. IT minister Richard Alston introduced amended legislation in December, after making a deal with Tasmanian Greens Senator Bob Brown allowing the Tasmanian TAB to accept online bets. Brown then supported the ban, giving Alston the numbers to pass the law.

The government will use the 12 month moratorium, backdated to May 19, 2000, to investigate an outright ban on Internet gambling in Australia. "The big decision on online gambling will be made next May, when the moratorium expires," Brown said.

The ban sent shockwaves through the fledgling industry. Many businesses had pushed ahead with new ventures following the defeat of the original legislation in the Senate on October 9. Operators

who defy the ban face fines of up to \$1.1 million per day.

GoCorp has closed down its Ausvegas Web site, which opened for business just three days before the ban came into effect. GoCorp was unable to escape the ban because it did not have any genuine paying customers by the May 19 deadline.

The ban leaves Australia with one legal online casino, run by Northern Territory company Lasseters. The ban will force the casino to roll back changes made since May 19.

"This legislation takes away the only consumer protection for online gamblers that exists in cyberspace today, and will only serve to force consumers into the arms

of the many potentially unscrupulous and unregulated operators that exist around the world today," GoCorp stated.

GoCorp is preparing to take legal action against the Federal Government, seeking compensation for the \$30 million it spent developing its online casinos. GoCorp has suspended trading of its shares on the Australian Stock Exchange while directors review the future of the company.

Fiona Angus



Cybersquatters lose domains

Australian cybersquatters have fallen foul of international arbitrators after registering domains similar to those owned by Telstra and the Australian Stock Exchange.

The first 'typosquatting' case involved Queensland-based Warren Bolton Consulting, which registered the misspelt domain bigpons.com in 1999. Visitors to the site saw the message: "No! we are not the big Australian but by God you were close!" The domain was also reportedly for sale for \$460.

Telstra complained to the World Intellectual Property Organisation (WIPO), saying the domain was too similar to its own, bigpond.com. The Geneva-based arbitrator has since ruled that the domain be given to Telstra.

In another case, WIPO ordered that Community Internet (Australia) in Western Australia hand over the address australian-stockexchange.com. The domain did not

link to an active Internet site and WIPO ruled it had been registered in bad faith.

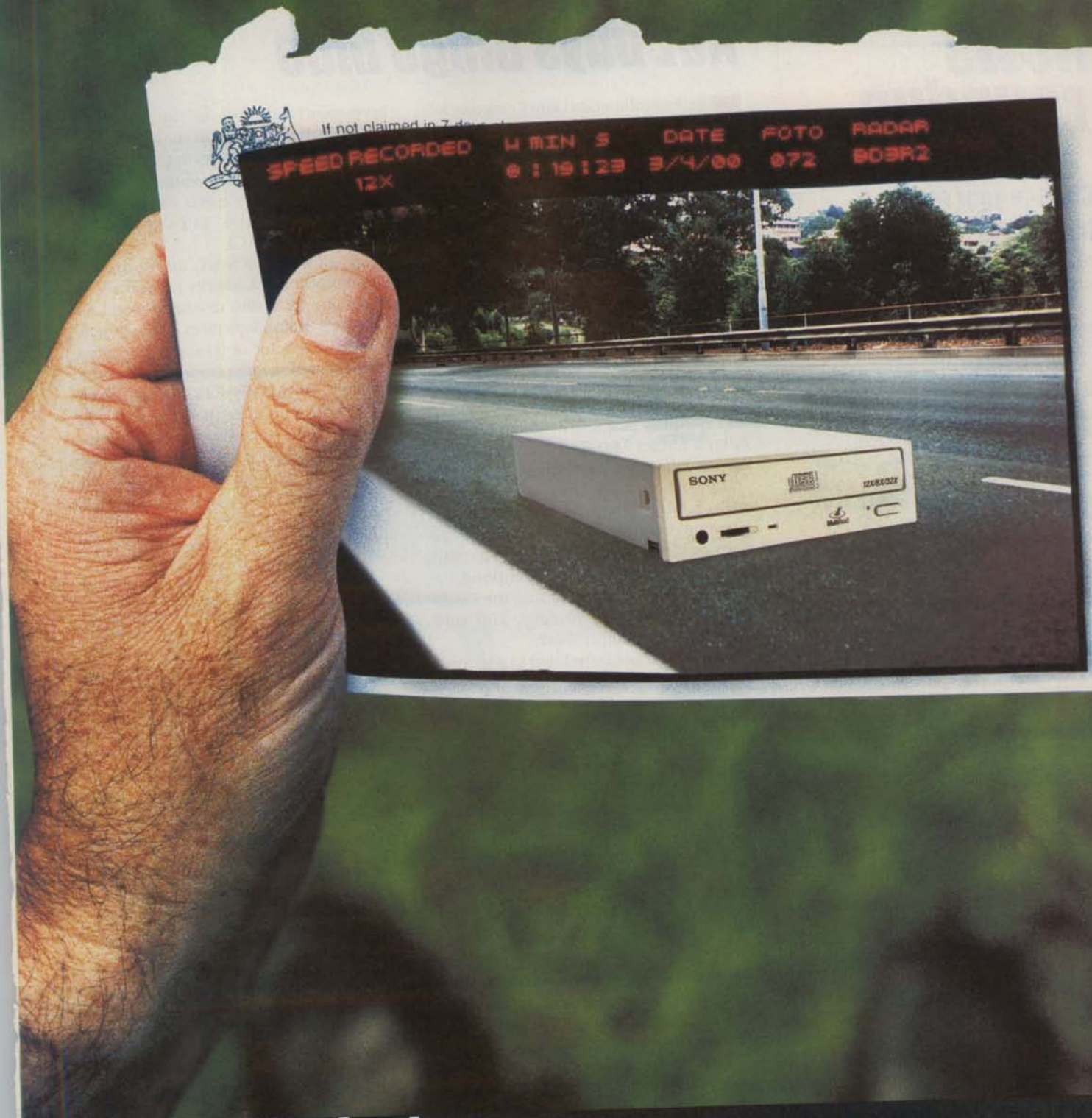
However, Community Internet argued it had purchased the address to keep it safe from cybersquatters. WIPO said that the party had spent "considerable time" registering "vulnerable" domains of companies with which it had "trading relations".

Other domains currently registered by Community Internet include australianbroadcastingcorporation.com, channelsevenaustralia.com, channeltenaustralia.com and commonwealthbankofaustralia.com.

In other recent WIPO judgments, the Sydney Opera House regained control of the domain sydneyoperahouse.net from Sydney company Trilynx. Like Community Internet, Trilynx argued it was trying to prevent the domain from "falling into the wrong hands".

William Maher

SONY



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News roundup

Choose your own bandwidth

Telstra has set up a real time Web-based 'dial' to allow customers on its high-speed Internet network to independently adjust their own bandwidth capacity. Telstra claims it is the first Net-based 'bandwidth on demand' facility in the world. Businesses linked to Telstra's wideband network can manually set their bandwidth capacity to one of seven grades, from 10Mbps to 1Gbps. Charges are based on the amount of time spent on different levels of bandwidth, timed to the nearest second. Telstra believes the 'bandwidth on demand' concept also has potential for the consumer market.

Ad dollars dry up

Rumours of a downturn in online advertising continue, with research company IDC warning that local advertisers should not rely solely on the Internet for brand promotion. IDC's latest forecast is that the online advertising market in Australia will grow from \$US56 million in 1999 to at least \$US271 million by 2004. This may sound impressive, but IDC warns that the Internet industry will probably be hoping for more. In November, LookSmart founder Evan Thornley forecast flat growth for the following three months, adding that the company is undergoing a "transition" to reduce its reliance on Internet advertising. LookSmart now also earns money by charging to review sites and fast-track them onto its directory.

AOL and Time Warner closer to merging

The \$US109 billion merger between Internet provider AOL and media giant Time Warner looks set to go ahead after official approval from America's Federal Trade Commission. It was granted with several conditions ensuring that AOL Time Warner does not prevent rivals from using its cable infrastructure. The new merged company was originally valued at \$US350 billion but is now worth less than \$US300 billion due to a fall in AOL's market value. The merger will now go before the US Federal Communications Commission.

AGL buys dingo blue

The Australian Gas Light Company has bought telecommunications retailer dingo blue from Cable & Wireless Optus for \$22 million.

The utilities company currently sells gas and electricity to residential and business customers across the country, and plans to offer telecommunications services as part of a package deal.

"This acquisition is an important step forward in the strategy we announced in early 2000," AGL managing director Len Bleasel said. "AGL will be able to offer a suite of telecommunications products and services to our two-and-a-half million gas and electricity customers." dingo blue will bring a further 74,000 customers, which it amassed during its 16 months of operation.

dingo blue offers Internet access, as well as local, long distance and mobile telephony services. It recently entered the financial services market, offering a credit card through the Bank of Queensland.

AGL plans on maintaining the dingo blue brand and all 190 dingo blue staff including CEO Martin Paech.

AGL's purchase is the latest in a series of technology-based investments for the company. Last June, AGL purchased a 20% stake in TransACT which was set to introduce the first broadband fibre-optic network in the ACT. Four months later, AGL joined US investment bank JP Morgan in raising \$40 million to fund IP-based wholesale carrier COMindico. The COMindico

investment was seen as significant for AGL, which was trying to shake its image of being solely an energy supplier. More IT investments were also promised.

Bleasel said he expects dingo blue to be "earnings positive" in its first year of operation under AGL.

In related telco news, the Australian Communications Authority has released its report into fixed and mobile networks for the period ending September 2000. The government regulator of telecommunications services found mobile phone subscribers on the GSM Telstra network in New South Wales experienced the most dropouts and the worst congestion. Hutchinson Telecommunications, which operates the Orange One CDMA network, provided data, but it was not included in the findings. "The ACA is reviewing the data with a view to developing comparative reporting for all CDMA networks," the report states.

As part of its telco monitoring responsibilities, the ACA conducts a consumer satisfaction survey once a year. The latest survey found that consumers are generally happy with their Internet connection, but that satisfaction with billing had dropped and that billing issues dominated complaints. In 1999, 81% of household users and 85% of business users said they were satisfied with the accuracy of their ISP bill. However, in 2000, these figures had decreased to 77% and 68% respectively.

Roulla Yiacoymi

Games "unhealthy" for girls

Video games are under attack from critics who say top-selling games' female characters are flaunting too much of their bodies and that console makers appear to be stuck in the dark ages when it comes to their cyber-heroes. US child advocacy group Children Now has even declared the games "unhealthy" for girls, saying that female game characters often resemble Barbies.

Children Now reached its conclusion after examining the ten top-selling games for the Sega Dreamcast, Sony PlayStation and Nintendo 64 games consoles. Female characters were too often portrayed stereotypically; scantily or provocatively clad, talking in high-pitched voices and even fainting.

Children Now claims that of those

games with female characters, 23% include exposed breasts or cleavage, 31% exposed thighs, 15% exposed behinds and 31% exposed stomachs.

This is not really surprising as console gaming is a market dominated by men. Australian PlayStation Magazine lists males between the ages of 14 and 34 as its core target readership. The magazine's editor Narayan Pattison acknowledges the concerns, but says that "things are starting to improve" with games such as Perfect Dark and Dino Crisis featuring tough female leads.

Meanwhile, PlayStation character Lara Croft, who raised eyebrows due to her enormous bust, is about to get her own movie starring Angelina Jolie.

William Maher





Actual size

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What do IT giants leave behind after taking their profits back to the US?

Charity begins at work

Microsoft wants to give Australian children 'technological equity'. So says head of Microsoft Australia Paul Houghton, who recently launched a \$10.8 million plan to 'bridge the digital divide'.

The software giant has amalgamated its Australian charity projects under an umbrella organisation called the Microsoft eMpower Australia Campaign.

However, this doesn't mean that Microsoft has scaled up its philanthropic initiatives. Over the next 18 months, the company will spend the same amount on charity that it spent in the previous 18 months.

The centre of eMpower is a \$6.5 million plan to provide Microsoft-certified training in high schools. After learning how to use Microsoft products, students can pay to sit a Microsoft exam and qualify as a Microsoft systems engineer — which may create a legion of dedicated Microsoft users.

Microsoft is the biggest philanthropist in the IT field. IBM, another big spender, contributes an average of \$1 million a year and also aims to boost IT skills among students and groups with limited access to technology. It supports about nine education projects, such as the Young Achievement Business Skills mentoring program and an Aboriginal IT literacy skills initiative.

A calculated commitment

eMpower has a long-term commitment to the Inspire Foundation, an Internet-based outreach program for troubled teenagers. "Corporate Australia is coming on board, but it still has a way to go," Inspire founder Jack Heath said.

Heath spoke frankly about the often sticky involvement of major corporations in community initiatives. "I know there will be many who will be cynical, and in some cases that's fair," he said. He pointed to a US study that found 76% of consumers prefer products from a charitable corporation.

Community initiatives can make consumers feel good about buying a company's products. For companies dependent on the consumer market, this can be a valuable marketing tool and a powerful way to reinforce corporate branding. eMpower has the hallmarks of a classic marketing campaign, with its own corporate brand name and a logo designed in the Microsoft style.

This desire to win over consumers is the reason companies choose 'fashionable' causes and avoid controversial issues. Computer Associates' philanthropic efforts are driven by US head Charles Wang, who favours children's charities. CA has a commitment to children's craniofacial surgery charity The Smile Train, and last November helped set up a Web site designed to locate missing children in Australia. When CA Australia managing director John Ruthven was asked why the missing persons Web site didn't extend to adults, he replied, "that's the company policy".

Houghton admitted that although those over 55 are seriously disadvantaged when it comes to accessing technology, Microsoft's initiatives are geared towards young people.

The value of giving

Compaq takes a different approach to local charity. It has secured international naming rights over two high-profile international charities. One is the Starlight Foundation, a charity for seriously ill children. Compaq is also entitled to be known as the 'official technology sponsor' of Clean Up Australia and Clean Up the World.

Compaq refuses to disclose how much it spends on the community. The company claims that it makes a 'significant' contribution in cash, products and staff time.

Companies are often reluctant to reveal exactly how much they give because doing so makes it easy to assess their corporate citizenship. Bill Gates gives away billions, but when compared with his towering wealth, this fact loses much of its altruistic glow.

Valuations based on contributions of products and staff time are also problematic as they are often valued at their selling price rather than at what they cost the company to provide. Houghton declined to provide a breakdown of how much of the \$10.8 million will be cash and how much staff time and software. Of course, the inevitable tax write-off doesn't hurt either.

The Australian connection

Microsoft's charitable works are not always tightly monitored and staged. For instance, the company matches any contributions up to \$10,000 that staff make to



local charities. Last year, beneficiaries included Anglicare and the Salvation Army. "We encourage employees to do this on their own," Houghton said.

In fact, much of the charity given by multinationals is driven by local staff. Apple keeps the value of its charitable contributions under wraps, but its community efforts are managed by local staff. Recently they banded together to raise funds for a child with cancer, and the company often makes one-off product donations. On a corporate level, Apple participated in an initiative by the Attorney-General's department to provide access to technology for people with disabilities. "We look at ways to help people who are disenfranchised from technology," a spokesperson said.

Security software provider Symantec openly admits to a less organised approach to local charity. According to the company, which is worth \$US2.2 billion with annual sales of \$US746 million, it has no formally organised local charity initiatives.

The last contribution the company made was a small handout to Meals on Wheels, which approached the company for a donation. Other haphazard arrangements include money raised by staff through the Variety Club of Australia BASH and a one-off \$10,000 contribution to the Starlight Foundation.

Like Microsoft, Symantec matches contributions employees make to charity. However, unlike Microsoft, Symantec is almost entirely focused on the enterprise market, so the value of charity to the bottom line is not as great.

Fiona Angus



Actual size

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*What happens when a computer is seized
as part of a police investigation?*

Hacking the bad guys

You've seen it thousands of times on TV. At the crime scene, the detective carefully places the bloody knife or fragment of hair into a plastic bag for forensics. But what happens if the evidence is digital? Tracking digital fingerprints can be as important to modern police work as dusting for physical ones.

Andrew Rosen is a forensic computer scientist and president of ASR Data Acquisition & Analysis, a US company that provides tools and training to legal, law enforcement and investigative organisations.

He regularly acts as an expert witness in US courts and recently visited Sydney to instruct Australian police officers in the latest techniques for gathering and preserving digital evidence.

"Unfortunately, virtually any type of crime that has existed in a traditional form has migrated to the Internet and the new electronic frontier," Rosen said. "Forensic computer science is analogous to using the yellow tape that says 'crime scene, do not cross', taking the photographs, making the measurements, collecting the bloody gloves and the fibre samples and all that sort of thing."

Timestamps on files, data recorded by operating systems, network server logfiles, and fragments of data that remain on a hard drive after deletion are all the electronic equivalent of 'fingerprints'. Most people, including criminals, are unaware that clues like these even exist.

Police officers are gradually learning that the preservation of digital evidence can require even more care than physical evidence — it's not just a matter of cranking up a suspect's PC and opening files. Special software tools are available which look at another hard drive and extract evidence without altering any data.

"The simple act of turning on a computer changes information on a hard

drive," Rosen said. "If someone were arrested for, let's say, sexual exploitation of a child, and they were thrown in jail and the police had a warrant and took a look at their computer, it's very possible that by handling that computer improperly or even simply by turning it on to see



what's on it, they would produce data timestamp changes and other internal things such as the swapfile being changed. A court of law would require a lot of explanation as to why the computer has been interfered with while the suspect was in jail."

Forensic computer science is rarely used as the primary means of investigation. There is usually no substitute for good, solid police work of the traditional kind, and computer data is more likely to be a source of corroborating evidence than the basis of a trial.

"As we've seen in other cases, just having the bloody glove isn't proof positive from a legal standpoint," Rosen said. "I think you could draw a loose parallel with DNA technology, in that you've got physical evidence, you've got your suspect who has the scratches or the cuts or the bites or something of the sort, you've got the victim with some skin under their fingernails or some other potential connection to the suspect. How that skin came to be under the victim's fingernails is a question that DNA technology cannot answer by itself. But in many cases it will prove that this is the DNA of a particular suspect."

During Bill Clinton's impeachment trial, ASR was involved in examining Monica Lewinsky's computer for evidence of email exchanges between it and the White House. Rosen has been called on to trace evidence against paedophile rings, and ASR is also involved in providing evidence in murder and fraud cases. The wide availability of high-end scanners and printers means tracing the origin of 'questionable documents', such as false immigration papers, counterfeit money and other forged material are also regular tasks for the company.

Keeping up with the Corleones

Rosen believes everyone associated with bringing charges against a suspect needs a good understanding of computer forensics to fully appreciate how the evidence supports the charges.

"It seems to me a lot of people are looking at the computer technology and saying 'that should be the realm of the geeks'," he said. "But the reality is that law enforcement has repeatedly been given the task of adapting to new technologies. Things like the breathalyser tests or radar for traffic speeding — these are all new technologies that are very complicated, but if law enforcement officers are the ones deploying this technol-

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ogy, I believe they should understand it intimately."

According to Rosen, computer crime squads should have a combination of computer specialists and officers from other backgrounds. Keeping up with the 'bad guys' takes some serious teamwork, because the 'good guys' rarely have access to the same standard of equipment.

"Criminals definitely have an advantage over law enforcement. They tend to be much better funded — they have the proceeds of their crimes to buy the newest, fastest, fanciest equipment. And they do not have the constraints of having to operate within the law. What we seek to do with the training and the technology that we provide is level the playing field. If the bad guys have an advantage — what they can do versus what the police can do — then I think that law enforcement should at least have the tools and technology that enable them to counter that advantage."

Rosen warns that the worst is yet to come. "All the technology is in a constant state of evolution. Today's cutting edge technology has not been fully exploited yet by either law enforcement or criminal enterprise."

Cracking the code

One of the biggest obstacles for those trying to extract evidence from computers is the widespread availability of modern encryption software.

"Encryption can really throw a monkey wrench into the process. If a criminal uses rigorous encryption on the contents of their computer, it's far more secure than a physical strongbox, where you can just cut the lock off and have a look inside," Rosen said.

"If you create strong controls on encryption, that is a step towards an Orwellian society."

Despite the problems associated with strong encryption software, Rosen opposes government attempts to control it. "I believe that encryption should be available to the public and private sector, that we should fully exploit the capabilities of our technology," Rosen said. "The vast majority of the people who use encryption are in the corporate sector. We hear about people having their laptops stolen at airports. There is an important need for strong encryption so that the dangers presented by those scenarios can be greatly reduced."



"I also believe that private citizens should be able to communicate privately. If you create strong controls on encryption, that is a step towards an Orwellian society. If you regulate, it's kind of like gun control in the States — making guns illegal means that only criminals will have guns — and the same kind of thing could happen with encryption. Encryption technology is available, the genie is out of the bottle. If it's used for criminal purposes, you need to do something about the criminals, rather than trying to control the tools that they are using."

Few criminals are smart enough to cover up all their digital fingerprints, but Rosen is sure there are some who get away with it. "There's an adage among law enforcement officers dealing with computer crime that says 'we really only catch the dumb ones'.

techniques are always the precursor to actually looking at the contents of somebody's drive."

Investigations into paedophile rings or child porn sites on the Internet often work this way, Rosen said. "Typically, when a server that contains client or subscriber information is taken down, the telephone records, the credit card charges and the content of the server are an abundant source of what is called 'probable cause' and give a legitimate reason to suspect that somebody has been accessing inappropriate materials over the Internet."

Although criminals can use encryption to hide evidence, Rosen pointed out that this can also damage a defendant's case. "In many jurisdictions failure to comply with a lawful request for the password means judges will assume the worst. If I have a PGP disk, a 40M encrypted container, and I decline to provide the password to allow for the examination of its contents, then regardless of whatever constitutional rights I might enjoy, the assumption will be that I'm hiding something," he said.

"Although people enjoy the right not to incriminate themselves, the inferences that can be drawn from a suspect not cooperating tend to suggest we have the 'probable cause' we need to get a warrant. We know the suspect has paid for this service, that they accessed this service, that this is the type of material that was available from this service, so we don't really need the suspect's cooperation at that point. We're going to make our case based on the evidence that we've already got without even looking at the computer."

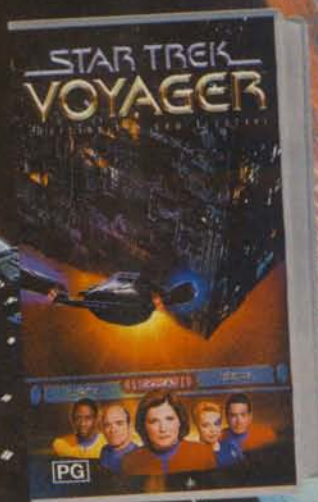
Simon Vandore

In other words, the smart, successful criminals are eluding detection and prosecution. But encryption technology is really not as big a bugaboo as it might seem. When law enforcement is aware of a criminal, often the information contained on their computer supports the police case.

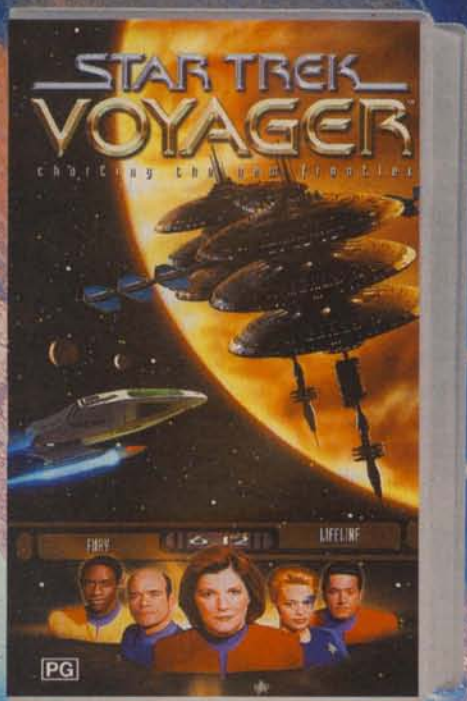
"I'm not aware of any cases that have been completely dependent on evidence from the contents of somebody's hard drive. Law enforcement has to have enough of a case to get a search warrant to take a look at the hard drive to begin with — good, old-fashioned investigative

THE VOYAGE IS COMING TO AN END

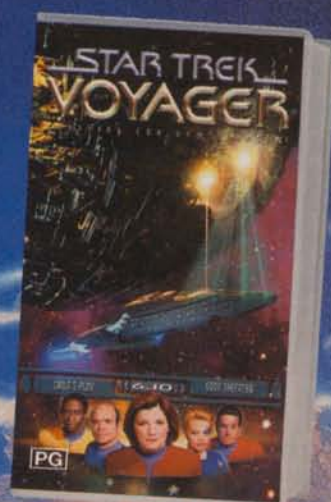
One of the most highly anticipated season endings



6.8 (TSUNKATSE/COLLECTIVE)



6.12 (FURY/LIFE LINE)



6.10 (CHILD'S PLAY/GOOD SHEPHERD)

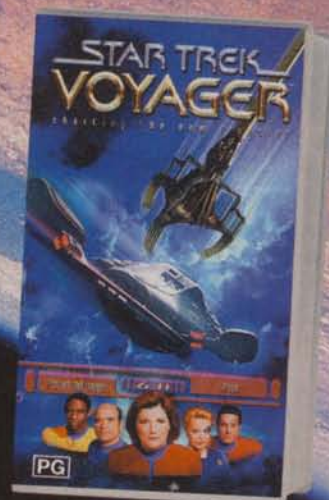


6.9 (SPIRIT FOLK/ASHES TO ASHES)



SEVEN OF NINE
COLLECTION
VOLUME I
FEATURING
8 EPISODES
FROM THE
VOYAGER
SERIES

PG



6.11 (LIVE FAST AND PROSPER/MUSE)

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Taking notice

Most technology pundits agree that the future is smaller, cheaper and wireless. APC takes a look at a couple of notebooks that are rather different from the standard 'Intel and Windows' option. Are they the way of the future, or just a pretty distraction?

A room with a Vaio

Sony's new Vaio has enough style to rival Apple's super-cool iBook designs and is also one of the first devices to feature Transmeta's new Crusoe processor.

Manufactured specifically for battery-powered devices, the Crusoe chip supposedly uses less power. This means more battery life and no need for the cooling fans commonly found in notebook PCs. The 600MHz chip has the ability to adjust its speed according to the needs of the application being run, and Sony claims the chip gives its new PCG-C1VM a battery life of five-and-a-half hours. The Crusoe also uses a 'smart layer' of software to perform functions that would usually be done by a chip's hardware.

Despite the hype, opinion remains divided on whether the Crusoe can squeeze much extra life from notebook batteries. Tests conducted by APC found the battery on the PCG-C1VM lasted two hours and 22 minutes in performance mode, but in economy mode this only increased to two

hours and 30 minutes. The results were almost identical when the PCG-C1VM was set for maximum and then minimum CPU performance. Transmeta is very keen to point out that most benchmarks don't yet reflect the way the Crusoe manages power. There's some truth in this, but it's also a handy excuse for the chip's obviously poor performance.

The Vaio's battery results certainly aren't spectacular when compared with the ultraportable machines reviewed by APC in June last year (APC June 2000, page 104), but it's hard to make a fair comparison because there are no other locally available Crusoe devices yet. Without similar devices to compare the Vaio with, it's difficult to draw any final conclusions about power performance.

If battery life is really important to you, wait and compare the PCG-C1VM to some other Crusoe devices. At the time of writing, NEC, Fujitsu and Hitachi had begun selling Crusoe laptops overseas, while Transmeta was fighting to convince Toshiba to use the processor.

If, on the other hand, portability is your main priority, look no further. The PCG-C1VM is small enough to fit easily into a briefcase or small carry satchel. Inside, it has a 12G hard drive and 128M of RAM, which is more than you'll find in some much larger notebooks. Disappointingly, the small size means the Vaio comes without a floppy drive or a CD drive. Both must be purchased separately and attached externally.

The Vaio's extra multimedia capabilities are really making headlines for Sony. The tiny device is crammed with audio and visual tools, including a built-in



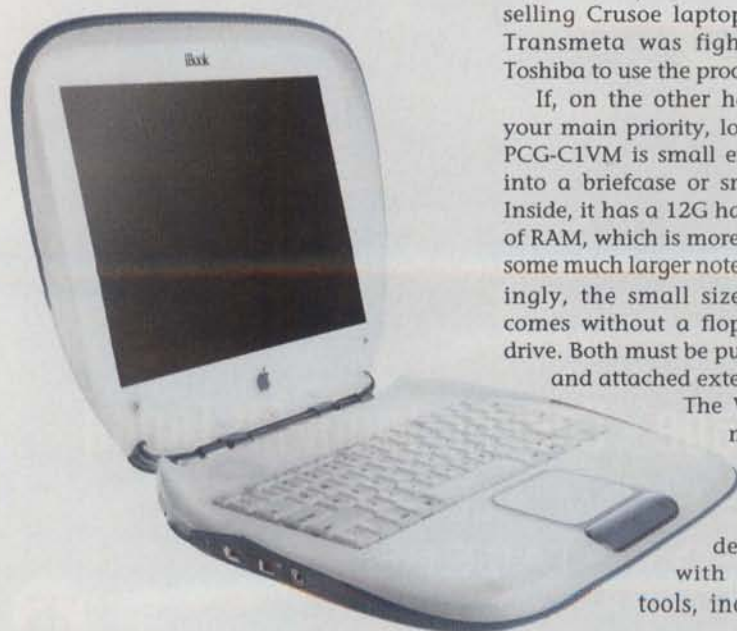
digital camera for snapping pictures and recording movie snippets. The machine also has an i.LINK port for transferring video from digital video cameras, as well as a slot for Sony's Memory Stick.

MovieShaker, Sony's alternative to Apple's editing software, iMovie, is also included. Select some videoclips, choose a mood and the software will mix and match your footage to music. It's fun, but don't expect it to produce a masterpiece. MovieShaker also allows you to edit videos manually.

If you're thinking of using the Vaio for semi-professional use, think again. Editing is difficult on such a tiny screen and the camera is really only useful for personal use because it can only record up to 120 seconds of footage. An extended mode is available, but you are still limited to 1G of space per disk.

The Vaio is probably best suited to online reporters or to people wanting to update Web pages with small movie snippets, especially while on the road. It would also be the perfect companion for the wired traveller. Imagine being able to send home video postcards at the click of a button!

The Vaio has some very cool features, but be sure you genuinely need them before handing over your hard-earned money.



Talking books

The Vaio allows you to sidestep Intel, but why not dump Microsoft as well? Apple has had a hard time convincing non-Apple users of the value of Mac notebooks, and the company has added more extras to the iBook Special Edition (SE) in an effort to convince consumers the iBook is more than just a pretty face.

A DVD player, a faster processor, extra hard disk space and more memory put the SE on a similar footing to a low-end PowerBook. However, the SE costs about \$1,000 less than the PowerBook, and about the same price as a mid-range Pentium notebook. The SE comes with a 466MHz G3 processor and 256K on-chip level 2 cache.

The 64M of RAM is an improvement on the paltry 32M included in the original iBook, but is far less than that offered by other machines in Apple's notebook range, or by its major rivals. This is a serious flaw for a so-called 'special' edition. Upgrading to a more acceptable 128M costs an extra \$388, and you can go as high as 320M if you are willing to pay for it.

The disappointing amount of memory has other implications for Apple. Shipping the SE with a mere 64M may jeopardise the uptake of Apple's soon-to-be-released OS X. The current beta version requires at least 128M to run, and even if the final release is not as demanding, the SE is sure to struggle under the new OS.

iBook SE

Pros Classy Apple design
Good battery life

Cons Low on memory
Noisy disk loading

Contact Apple
Phone 13 36 22
Online www.apple.com.au
Price \$3,795

Vaio PCG-C1VM

Pros Small and stylish
Built-in i.LINK port and camera
Cons Battery life still poor
CD-ROM and floppy drives not included

Contact Sony
Phone 1300 13 82 46
Online www.sony.com.au
Price \$3,799

Adding to its woes, Apple has forecast that sales will fall short of expectations by 40% in the December quarter. This will give the company an overall loss of \$US250 million. This is Apple's first loss since Steve Jobs reclaimed the top job three years ago and spearheaded the iMac and iBook range. The company is now depending on the iBook to appeal to the education market, and on an improvement in the slow sales of the Cube.

When announcing the loss, Jobs admitted that Apple's slower processors were a major cause of the slump in sales. Thanks to the improved processor in the SE, APC found performance acceptable, but the inadequate memory meant that running multiple applications was frustratingly slow. Playing DVDs while working in a separate application produced patchy performance. However, overall DVD performance is reasonable, even if the machine feels like it is preparing for a noisy take-off when loading a disk.

The iBook's display is a small (12.1in) but excellent TFT SVGA active matrix screen. In contrast, the single built-in mono speaker is muted and maximum volume is unimpressive.

The FireWire port boosts the iBook's otherwise limited ability to support more than one peripheral at a time. The iBook has only one USB port, which is necessary for removable storage as Apple has done away with the floppy drive.

The headphone and speaker AV port can also connect to a conventional TV set, which will automatically mirror what is on the iBook's screen. This feature is designed to appeal to the education market, and an AV cable is included to ensure the machine integrates well into the typical classroom.

The SE has built-in AirPort wireless networking, a 56K modem and 10/100BaseT Ethernet connection. Apple has included two extras to spruce up the otherwise basic package. In a concession to gamers, the iBook now comes with an ATI Rage Mobility 128 graphics accelerator and two 3D games. Apple's flagship software product, iMovie 2, is also included, but serious video editors and gamers will be hampered by the limited speed and screen size.

Apple claims the battery can hold out for about six hours, but APC found three to four hours more realistic. The battery life indicator is unreliable, but there is a light around the power socket that glows green when the battery is charged up, and orange when it needs charging. The SE comes in a muted grey colour, which is a relief for those not keen on the only other shade: toxic-sludge green. The

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Lego Studios 38

inside casing and keyboard are a luminous bright white, producing a colour scheme some APC staff found a little sudden first thing in the morning.

The SE's rubber and plastic outer design is the same as the original iBook's, and is extremely robust. Disappointingly, this sturdiness does not extend to the embedded keyboard, which is extremely flimsy. The tray is not secured evenly on both sides and the entire right-hand side (with the much-used 'delete' and 'enter' keys) bends under the pressure of normal typing action. Despite this flimsiness, the SE is heavy (3.1kg).

The \$3,795 price tag, improved processor, extra hard disk space and DVD player compensate for the shortcomings, but with so little RAM the iBook will never be considered truly special.

*William Maher and
Fiona Angus*

Macromediamania

It seems that Macromedia feels the need to release at least one new version of its Web design tools every 12 months or so. Dreamweaver and Fireworks are already pretty nifty tools — in fact, Dreamweaver was awarded Editor's Choice in APC's last two roundups of HTML editors, beating the competition resoundingly. What could Macromedia possibly do to these pieces of software to improve them, and more to the point, is it worth upgrading?

The first major change in both programs is the inclusion of the 'Macromedia Interface'. This is a bright, shiny marketing term, but all it boils down to is that both programs use the same icons, menu layouts and visual style. For some people, this is the bee's knees, but for others, it's merely window dressing. APC found it useful to have common tools in standard places. It brings the Apple and PC versions much closer together, which basically means the applications all look a lot more Mac-like.

Dreamweaver 4

When APC first heard that a new version of Dreamweaver was on the cards, we were curious as to what could be added to this already classy product. We also wondered whether they'd be worthwhile enhancements. We were pleasantly surprised.

One of the major changes in Dreamweaver 4 is the inclusion of a really good text editor. Early versions of Dreamweaver had an editor that was good, but not great. Dreamweaver 3 spruced things up a bit with code lines, and in Dreamweaver 4 the additions really make the code view useful.

The code window can be launched as a floating window (as it was in previous versions of Dreamweaver) or as a complete split pane, depending on user preferences. In a neat cross-promotion, Dreamweaver 4 incorporates the O'Reilly guides to HTML, CSS and Java as part of the text editor. This means every term is searchable from the code window. So if you're trawling through someone else's code, confused as hell, help is at hand.

Dreamweaver 4 also has a useful facility for table creation. Tables in the layout view can be dragged into shape, cell by cell, by switching to layout mode. With a quick flip back into normal mode, the complex table structure can be seen easily. This allows Web designers to lay out exact tables and pages quickly and precisely.

Macromedia has slowly been accelerating the interoperability of its products, and Dreamweaver 4 is no exception. Apart from the ability to edit directly into Fireworks and then out again (a feature introduced in the 3.0 release), you can now directly create Flash buttons and text within Dreamweaver. This is still a far cry from actually including Flash, but it does enable quick and painless simple vector creation.

One of the few complaints APC has had in the past with Dreamweaver is that it can be something of a memory hog. In our testing, we were pleasantly surprised to find that this has been rectified to some extent. You'll still notice the memory hit, but it's nowhere near as demanding as it was previously.

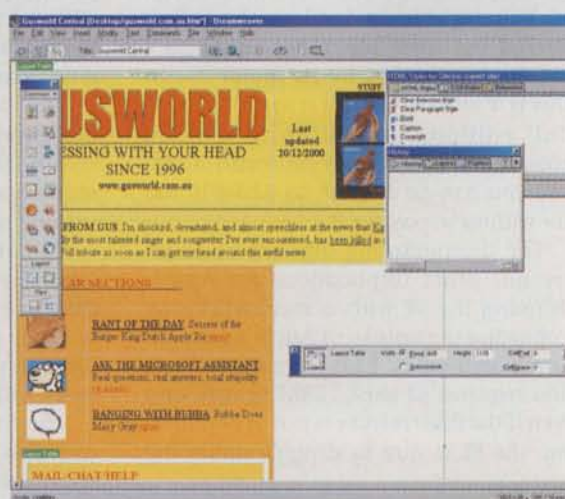
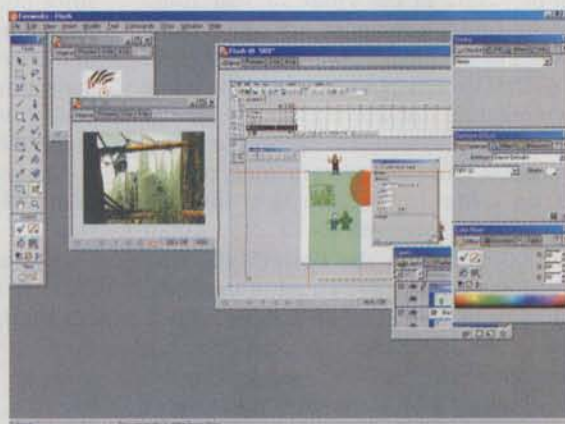
If you're not a Web site guru, Dreamweaver can seem a little confusing at first, but its screen design (which is rather like a word processor) is quite helpful. Also helpful is the Macromedia exchange, an online storage spot for Dreamweaver add-ons — great for those who shudder at more complex function design.

Fireworks 4

Like Dreamweaver, Fireworks has always offered a robust graphics design environment. It must have been a serious blow to Macromedia that Adobe started making ImageReady a standard part of Photoshop 5.5, but the company seems to have recovered well with some impressive improvements. Unlike Dreamweaver, the extensions to Fireworks won't be relevant to everyone. Many people will use them only rarely.

Fireworks 4 offers an easy way to create quite complex rollover and menu options. The Pop Up Menu creator allows you to quickly create sliding menus with a choice of styles. In a similar vein, complex rollovers can be created by dragging and dropping your selected elements into place — very easy.

Photoshop is still the effective standard in graphics creation and manipulation. Previous versions of Fireworks supported importing Photoshop files, albeit in a



rather kludgy manner; this support has been much improved in Fireworks 4.

Both version four releases of these products are good, but are they worth upgrading to? In the case of Dreamweaver, the answer is a definite yes — additions have been made in areas that will affect almost every code jockey. The case for Fireworks is less clear — it still does Web-based image management very well, but the additions won't be useful to everyone.

Alex Kidman

- | | |
|-------------|---|
| Pros | Uniform user interface |
| | Useful new Dreamweaver functions |
| Cons | New Fireworks features are gimmicky |
| | Fireworks still a big system memory hit |

Contact	Macromedia
Phone	(03) 9853 0900
Online	www.macromedia.com
Price	Dreamweaver \$729; upgrade \$335
	Fireworks \$729; upgrade \$335

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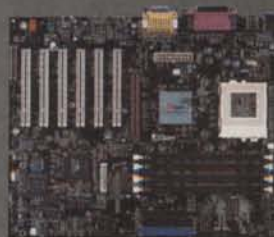
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Plus U3-1080 XGA

When APC reviewed projectors last September (see APC September 2000, page 110), many models were ruled out of contention by the \$7,000 price ceiling set for the review. Above this price bracket, projectors are plentiful, but it usually takes something new and innovative to catch APC's eye — in this case, portability.

The Plus U3-1080 XGA is the most portable and lightweight projector APC has reviewed. It measures just 4.8 by 23 by 17.7cm and weighs 1.3kg, which distributor Amber Technologies claims makes it the smallest and lightest projector in the world. It's much smaller than the Compaq MP1600 (see APC December 1999, page 37), which is the smallest projector we've reviewed until now.

This projector is not a home theatre model, so any dreams you may have of watching movies with it should be abandoned now. The unit is designed for the travelling executive who makes frequent presentations, and it's actually small enough to slot into the front flap of many notebook carry bags.

The image quality is superb, with very little loss of contrast at the corners. This is an advantage DLP projectors (digital light projection) have over most LCD (liquid crystal display) projectors, but DLP projectors are also more expensive. The onscreen display is detailed and easy to use, and it includes the usual image correction functions.

The projector is capable of a maximum resolution of 1,024 by 768 and has a brightness of 800 ANSI lumens. This is bright enough for use in the office during the daytime, even with the curtains open or the lights on, but like all projectors it works best in dim light. The projected image ranges in size from 90cm to 5m, measured diagonally, from a thrown distance of 1.2m to 6.8m, so it's ideal for small or large meetings.

The unit has RCA composite video in, RGB video in and S-Video in, plus audio in and a PS/2 connection for direct



mouse control. It comes with a remote control, which has a built-in mouse pointer. This allows you to take control of your notebook/computer and operate slideshows or presentations from a distance. Also included are a carry case, pouch and cables.

Darren Ellis

Pros Extremely small and light
Cons A little expensive

Contact Amber Technology
Phone (02) 9452 8600
Online www.ambertech.com.au
Price \$11,595

Hewlett-Packard PhotoSmart 912

Most consumer digital cameras have been modelled on the compact film camera, with a basic boxy look. Hewlett-Packard is the first to copy the SLR (single lens reflex) design format with the PhotoSmart 912. This chunky unit feels and looks, at first glance, like any medium quality SLR. However, behind the 34 to 107mm equivalent Pentax zoom lens and big handgrip lies a 2.24 megapixel CCD and a backmounted LCD viewing screen.

Memory storage is courtesy of a 16M CompactFlash card which sits in a Type II slot, and power comes from four AA batteries. The 912 is packed with clever details, and the power options are typical of this. Slip out the AA holder, and the whole handgrip becomes home to an optional long-life rechargeable lithium ion battery. Need to shoot over the heads of the crowd? The LCD screen flips down so you can frame the shot at up to 90° to the lens. Now here's the clever bit — the camera knows you have flipped the image from normal orientation, and compensates automatically when you show



the image through the TV connector cable.

The camera's specifications are just as impressive. Standard autofocus and exposure are available, as well as shutter priority, aperture priority, fully manual and program modes for night, action, macro and vista snapping. There's also exposure lock, direct print IrDA or USB image exchange, sound annotation and ISO settings from 25 to 400. This is a very adjustable and capable unit. The Digita OS menu (as used by Kodak) is excellent. It's easily understandable, and with a four-way toggle menu control, it beats many other camera systems hands down.

The camera uses a TTL viewfinder complete with dioptre adjustment, and adds 2x digital zoom to the optical range. Software on the CD includes Hewlett-Packard's Imaging and printing utilities, and ArcSoft's PhotoImpression and PhotoMontage applications. None of these is very impressive. An

Adobe or Ulead product would be better considering the hardware's flexibility. Powering up is relatively quick at just over a couple of seconds, but refresh between shots isn't great at four seconds.

Highest quality images come out at 1,600 by 1,280 pixels, with very accurate tonal fidelity and a minimum of optical aberration. Sharpness is slightly down compared to Nikon and Olympus 2 megapixel units, but is still in the very good bracket. The only flaws were slightly jerky zoom action, and a Type II slot that didn't recognise an IBM MicroDrive.

Jeremy Torr

Pros Extremely adjustable
Top-drawer controls and menu
Cons Jerky zoom
Unimpressive software

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3	Pro Mos Technologies	Semiconductor	588,655	21	114.63	10
4	VIA	Semiconductor	362,757	43	90.99	14
5	TSMC	Semiconductor	2,359,071	3	45.58	56
6	MSI	PC & Peripherals	509,680	27	64.53	29
7	Ritek	PC & Peripherals	461,728	31	162.86	6
8	Infodisc	PC & Peripherals	117,000	96	264.35	2
9	SIS	Semiconductor	349,687	46	69.34	25
10	Technology	Software	48,027	109	56.2	42

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Matrox Millennium G450 and Leadtek WinFast GeForce2 MX DH Pro

Getting a desktop PC to run with two monitors can be quite a task. A few years ago, anyone wanting to use a dual output feature would need two identical video cards and monitors. Matrox's G400 MAX was the first mainstream card to offer dual output from one board, and it did this by having twin CRTs and RAMDACs, a separate one to power each signal. Now, both Matrox and Leadtek have released new mainstream cards with this feature: the Millennium G450 and WinFast GeForce2 MX DH Pro. The new Matrox is a slightly upgraded version of the G400, and is cheaper than its predecessor due to a reworking of the board. Some components have been removed and placed on the chip instead. The Leadtek card is based on the GeForce2 MX chip, which is a scaled down version of the high-performance GeForce2 GTS.

The Matrox G450 APC looked at came with 32M DDR SDRAM, but it's also available in other RAM configurations. There's also a PCI version for fanatics who want even more display options. It has two VGA ports and an adaptor dongle for both normal and S-Video out. As is standard for a GeForce2 MX, the Leadtek comes with 32M SDRAM (which is one of the main reasons it was outperformed by the standard GeForce2, which has DDR RAM), and again has two VGA ports as well as an extra TV-out port and adaptor. Its video outputs are the same as the Matrox's.

Matrox and Leadtek are targeting different markets with their cards, so they stress different features. Matrox emphasises the G450's 2D performance and DualHead features over its 3D capabilities to tempt the business end of the market. Leadtek aims at upmarket home users who want good 3D capabilities and dual output support.

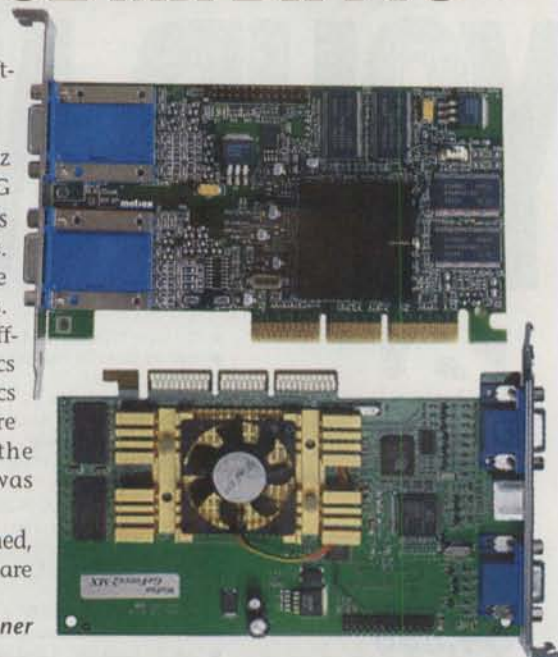
Matrox's DualHead and nVidia's TwinView share a lot of dual display features. They both have support for enlarged desktops, giving you the ability to move windows and programs onto the second monitor. They also have program-specific zooming so that, for example, you can display an enlarged picture on your second monitor while maintaining the standard view on the primary one when you're in photo-editing software. There's also cloning, where the card sends the same picture to both outputs. Driver and software support are also excellent for both cards,

especially for Leadtek's WinFox software, which monitors fan speed, graphics chip heat, and other factors.

The cards were tested on a 700MHz Celeron with 128M RAM and 10G hard drive. The Leadtek's 3D results were vastly superior to the Matrox's. However, there was little difference between the cards' 2D benchmarks. The Matrox was slightly ahead in Ziff-Davis' WinBench Business Graphics WinMark 99 and High-End Graphics WinMark 99 scores, but not by more than 5%. By the same token, the GeForce2 MX's Video2000 score was slightly higher than the Matrox's.

The cards are fairly evenly matched, apart from 3D rendering power, and are similarly priced.

Daniel Gardiner



Product	Leadtek WinFast GeForce2 MX DH Pro	Matrox Millennium G450
Contact	BCN Technology	Focal Point Computing
Phone	(02) 9648 0888	(03) 9372 6600
Online	www.leadtek.com.tw	www.matrox.com
Price	\$399	\$387
Specifications		
Graphics processor	256-bit nVidia 2nd-generation GPU	256-bit dual bus architecture
Video memory	32M SDRAM (128-bit)	32M DDR (64-bit)
Graphics processor/Memory clock speed	175/166MHz	125/166MHz
RAMDAC	350MHz	360MHz
Output types	2 x VGA, RCA Video and S-Video out through PS2 adaptor	2 x VGA, RCA Video and S-Video out through VGA adaptor
Bundled software	WinFast DVD, Colorific, 3Deep, True Internet Color, Cult 3D	Simply 3D 3, Picture Publisher 8, Matrox Software DVD Player
Benchmark results		
3D Winbench 2000	50.2	20.5
Business Graphics WinMark 99	247	252
High-End Graphics WinMark 99	714	738
3DMark 2000	3,555	1,868
Video2000: overall score	1,664	1,639
Video2000: quality	768	746
Video2000: performance	296	315
Video2000: features	600	577
Expendable lowest fps	26	14
Expendable highest fps	85	44
Expendable average fps	43.4	25.6
Quake III: 1,024 by 768 at 16-bit	66.2	28.2

The products used in these tests are shipping versions available to the public at the time of publication unless otherwise stated. All specifications details are submitted by the vendor and APC accepts no responsibility for any errors within. Winstone, WinBench and associated products are registered trademarks of the Ziff-Davis Publishing Company. These tests were performed without independent verification by Ziff-Davis and Ziff-Davis makes no representations as to the results.

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Brilliant plain paper photo quality automatically.

The BJC™-1000SP uses advanced colour definition routines for half-tones and areas of low colour density. A separate, selectable function called Photo Optimiser is included in the printer control software.



Before.



After.

It automatically adjusts for defects in exposure, highlights and shadows, and prints accordingly with standard inks designed to optimise quality on low-cost plain paper.

Reduced operating costs.

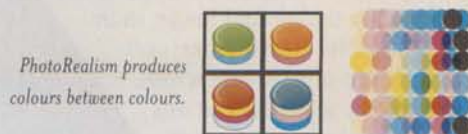
Using a special resolution matrix, the BJC-1000SP features a Super Economy mode that vastly improves operating economy without the definition sacrifices common to so many draft modes. It effectively quadruples output from both the black and colour cartridges.¹

High quality blacks at high speed.

The optional high capacity black ink cartridge uses 64 print nozzles for high print speeds. The selectable text smoothing mode goes up to 720 dpi to maximise text quality.



Optional BC-03 high capacity black ink cartridge.



PhotoRealism produces colours between colours.

PhotoRealism™ When superior photographic reproduction counts.

The optional PhotoRealism cartridge is ideal for high resolution paper, glossy photo paper and high gloss film.

Low-density inks vary colour saturation per dot to dramatically increase the colour combinations, reduce graininess and smooth tonal gradations.



Better Internet images.

Image Optimiser, a printer control software feature, can automatically "correct" low-resolution images up to the printer's maximum resolution.

Print banners up to 6 A4 pages long, envelopes, overhead transparencies, T-shirt transfers, and even choose an optional fluorescent ink cartridge for display effects.



BJC-1000SP
Just \$119^{RRP}

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support.

For more information call 1800 021 167.



Canon

Ericsson R380s

Ericsson is at last offering an alternative to Nokia's 9000 communicator. Its R380s Smartphone is a WAP phone, Palm substitute and email collection box rolled into one.

Only slightly thicker and longer than most mobiles, the R380s looks unremarkable. It has a multi-line screen, four-way menu selection buttons and the usual keypad. A voice recorder button and volume/backlight control sit either side of the screen, and a 950mAh, five-hour talk time lithium ion battery fits on the back.

The unit can be programmed to voice dial, and offers the usual features: calling tone, ring option, vibration and SMS facilities. It's only when you look closer, flip up the hinged keypad and expose the full-length touchscreen that the unit's full potential is revealed. As the keypad flips up, the display changes to full-screen 360 by 120 pixel graphics with icon-driven interactivity.

Like the Palm m100 the screen is plastic, but it's legible in most light and offers excellent character recognition in addi-



tion to a virtual keyboard option. An ARM RISC chip and 1.2M of memory run the Symbian EPOC OS, making the R380s noticeably faster than the Motorola Accompli. Ericsson has thrown in the added advantage of a direct email client. This avoids the chore of using a WAP gateway, and enables direct dial into any email provider, plus improved attachment handling. The only snag is that your password is left in the phone — not good if you lose it.

All the PIM functions are easy to access and use with the slip-out stylus, and written input is rapid once you learn the proper technique. The phone also incorporates a built-in IrDA window, so synchronising all the calendar, to-do and contact details to a host notebook is easy, even without the supplied serial connector cable.

The system can synchronise with Microsoft Outlook, Schedule+ and Exchange, and with Lotus Organizer and

Notes, and can beam all data types to and from Palms. To help place the R380s in the executive bracket, Ericsson has provided a free, dedicated help desk to guide new users through setup and initial use. Also supplied are a hands-free kit, a desktop synchroniser/charger stand and a copy of Lotus Organizer 5. This is a comprehensive package.

If Ericsson enabled the EPOC OS to use downloaded programs like the Palm does, it would probably win over the handheld market overnight. As it is, the R380s is a challenge to the dedicated mobile data device, and with cheap telco pricing plans, it offers a real alternative for those needing only standard WAP phone and PIM facilities.

Jeremy Torr

Pros Small, convenient
Cons Slow WAP, some kludgy menus

Contact Ericsson
Phone 1300 650 050
Online www.ericsson.com/mobiles
Price \$1,445, less on a plan

Opera 5

When Netscape Navigator crashes, it often takes large chunks of memory with it. When Microsoft Internet Explorer crashes, it often takes the OS with it. What's a Web fanatic to do? Well, there's always Opera, but many people have been put off Opera for two reasons. First, it's strictly HTML compliant, and this means that badly coded pages will appear as a jumbled mess. Second, it isn't free. In a market where the two largest competitors are free, paying customers are rare. However, the latest release, Opera 5, is free. There's a catch of course: an ad banner.

It's in the top toolbar and can be customised to appear in various fields. In APC's testing, we found the ad bar had a negligible effect on browsing speed.

Opera's main claim, that it is the 'fastest browser on earth', is an ideal marketing tactic because it's very hard to test, even with repeat access to the same sites. It does render quickly, but not always in the way you expect, as it adheres strictly to W3C guidelines. It's not the best browser for novices, mainly because almost every



aspect of it is customisable. For example, you can choose where you want menus to appear and which browser you want Opera to emulate. Other browsers handle coding quirks much more effectively, and there are pages you can't view with Opera. Some rendering is also a bit funny.

Opera 5's integrated and customisable search bar is also new. It defaults to Google but can be assigned to other search engines. It's very similar to features available in Internet Explorer and

Navigator. Opera 5 also integrates with ICQ for instant messaging.

Opera still lacks robust plug-in support, even for quite common plug-ins like Flash. Some Flash pages load quickly and well, others don't load at all. However, plenty of advice is available from Opera on how to install and troubleshoot most plug-ins.

Offering the browser free may pay dividends for Opera. It's not too hard to ignore the ads for the sake of a more stable browser.

Alex Kidman

Pros Fast page rendering
Small footprint
Cons Not all pages work
Not all plug-ins work

Contact Opera
Phone N/A
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Price Free with ads

I440 dpi, separate transparent ink tanks with monitoring system. \$279^{RRP}

EXTRAORDINARY QUALITY, superior operating economy, high speed printing plus extra rich blacks, parallel & USB ports for Windows and Mac, optional PhotoRealism and scanner cartridge.

Advanced imaging performance.

Resolution goes up to 1440 x 720 dpi. Drop Modulation Technology™ adds variable ink drop sizes that are automatically used in any of five pattern combinations. Then, the printer control software uses colour definition routines more in line with perceptions of the human eye. The benefits are obvious. Sharply defined lines and text. Vivid, more natural looking colours. Subtlety in shaded and highlighted regions with smooth colour gradations.



Colours between the colours with optional PhotoRealism.™

Low density inks vary the saturation level per dot (e.g. 33% or 67%) for up to five times as many colour combinations as conventional CMYK inks for smoother colour and tonal gradations with vastly reduced grain, even in areas of low colour density.



PhotoRealism produces colours between colours.

High speed printing for all colours, blacker blacks.

Using large print heads and bi-directional printing it prints up to four colour pages per minute. An optional, dedicated

black ink tank and cartridge with 160 print nozzles is capable of B&W speeds up to 9 pages per minute. And the black in both the standard and optional cartridge is an extra-rich black ink.



Automatic Image improvement, broad flexibility, optional scanning, Photo Optimiser adjusts for defects in exposure, highlights and shadows, and prints accordingly.

Image Optimiser can print low-resolution Internet images up to the printer's maximum resolution. Print banners up to 6 A4 pages long, envelopes, overhead transparencies and even T-shirt transfers. Turn your printer into a 720 dpi colour scanner with the optional scanner cartridge, pictured right.



BJC™ - 3000
Just \$279^{RRP}

Parallel and USB interface. Both ports are built-in for Windows and Macintosh.*



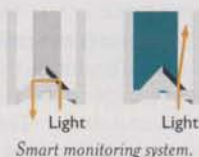
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Transparent ink tanks, "smart monitoring system," superior operating economy.

Standard inks are optimised for plain paper. There are individual, transparent ink tanks for all colours, and each is separate from the print head.

A beam of light measures ink status through a prism moulded into the bottom of the tanks. This allows a printer driver monitor to report on ink levels, and alert you when an ink is running low. You replace only one colour at a time, and don't have to worry about running out of ink.



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Palm Mobile Internet Kit

Keen Palm users can stay up to date with what's on the Web by using AvantGo, but there is a disadvantage: it's not real time. If you want last minute flight details or bargain auction bids, forget it. AvantGo only updates as often as you synchronise. Palm has spotted this shortcoming (met by the radio-linked Palm VII in the US) and come up with the Palm Mobile Internet Kit.

Existing third party applications already link Palms to the Net by means of mobile phones and special browsers. They usually offer three things: lots of waiting, cramped viewing screens and high phone bills. The Mobile Internet Kit gets around these problems by accessing a range of formatted (clipped) Web sites optimised for the Palm. Access is much faster and the images and displays are Palm-friendly.

Sites with frequently changing information such as stock reports, weather and news with images, graphs and logos are displayed far more effectively than on any

WAP device. The kit comprises a CD, a manual and a box to put them in. Selling for a promotional price of \$59.95, the software works like a standard Palm application. You install on the host PC which then uploads it at the next synchronising session. Along with the Web-viewing applications, you also get MultiMail email collection (suitable for accessing POP-mail) and PhoneSMS GSM messaging origination and collection.

The applications can link to a wide range of GSM phones and service providers, and can exchange data either through a hard link cable or the Palm IrDA window. Setup is fairly straightforward, but some of the SMTP and POP identifier dialogs could be a little more helpful, considering the wide user base Palm anticipates. Likewise, the CD-only PDF manuals are less immediately useful than a standard printed manual. However, once set up and linked to

a compatible phone (there's a large choice from Ericsson, Nokia, Motorola, Samsung, Siemens and more) the service is fast and smooth — using the supplied selection of clipping sites, that is. No local Web-clip services were available at the time of review, but f2, beenz and Yellow Pages should be available at launch. There are still plenty of US Web-clip sites available (over 400) and ABC News, WeatherChannel, Prudential and MapQuest are supplied. Tons more are available for download off the Web.

This is a useful and economical addition to the Palm arsenal.

Jeremy Torr



Pros Fast, easy, cheap
Cons Slightly laborious setup
Limited site access

Contact Palm
Phone 1300 360 558
Online www.palm.com
Price \$59.95

Lego Studios

Gone are the days when Lego consisted only of plastic blocks. The trickiest pieces of plastic in the whole assortment were the little men and the rounded snap-on lights. These days Lego comes with parts already constructed and moulded into different forms. So how do children get their Lego thrills when most of the complex tasks are already done? By filming them, of course. Lego Studios is a marriage between two things many of us admired when we were kids — Lego and trashy Steven Spielberg movies.

The set includes over 700 Lego parts, plus the centrepiece — a USB camera. Designed so kids can make their own movies, the set comes with all the software you need to get started. APC had some trouble installing the software initially — there are a few bugs in it — but after a couple of attempts it was up and running.

Our trial set came with mini Lego cameras, clapboards and lights, as well as a producer, camera operator and director (who is made to look like Spielberg.) This set also included two more figures that looked somewhat like Jeff Goldblum's and

Julianne Moore's characters in Jurassic Park: The Lost World — a suspicion confirmed by the inclusion of Lego dinosaurs in the pack. And for reasons that were hard to fathom, a cat.

The software is exceptionally easy to use and is broken into three main areas: the studio, post production and the theatre. All areas feature large, bright, friendly buttons and a drag-and-drop interface. The studio is the main part of the program and features a live image feed from the USB camera, plus a palette for completed clips. Movies can be made by capturing video from the camera, or by taking stills for stop motion animation.

Making the stop motion movies isn't as difficult or as laborious as it sounds. It took APC only 15 minutes to make a modest 12 second movie — and a further 15 minutes in the post-production section to add sound effects and music. This second area is the most technical part of the program, and features a movie editing timeline across the bottom, which is broken into sections for video, music, sound effects and visual effects. The supplied effects are



not overly impressive, nor is the music, but you can add your own MP3s and sound effects. Alternatively, you can record your own voice with the camera's built-in microphone. Once you've made a movie, it's time to show it off using the movie theatre. Movies are saved in AVI format. The compression is quite severe, so the picture quality drops quite a lot.

Darren Ellis

Pros Very easy and fun to use
Cons Some installation glitches

Contact Lego
Phone (02) 9428 9666
Online www.lego.com
Price \$299

Big printer performance.

Small printer price & economy. \$159^{RRP}

HIGH RESOLUTION COLOUR, high-speed blacks and superior operating economy with easy to use, broad flexibility for Windows and Mac. Plus optional PhotoRealism and scanner cartridge.



Exceptional results, easily.

The inks are optimised for plain paper with resolutions up to 720 x 360 dpi that can be automatically enhanced with Drop Modulation Technology.TM Variable drop sizes are placed in any of five "strike pattern" combinations to smooth colour gradations and improve tonal quality.



Reduced operating costs.

Super Economy mode uses a special resolution matrix to improve operating economy without the definition sacrifices common to so many draft modes. It effectively quadruples output from both the black and colour cartridges.¹



Better Internet images, special effects.

Image Optimiser can automatically "correct" low-resolution Internet images up to the printer's maximum resolution. Turn photos into simulated illustrations and create sepia and mono hues, print banners up to 6 A4 pages long, envelopes, overheads and even T-shirt transfers.



Duplexing, high speed blacks. A new driver allows manual duplex on plain paper with standard inks.

For B&W only, an optional dedicated black ink cartridge with 128 print nozzles offers print speeds up to 5 pages per minute.²



Built-in parallel and USB interfaces for Windows and Mac.¹

The optional scanner cartridge captures colour photos and text with resolutions up to 360 dpi.



Automatic Image Improvement, easily. Advanced colour routines help define half-tones and areas of low colour density. Photo Optimiser automatically adjusts for defects in exposure, highlights and shadows and prints accordingly.



BJC™ - 2100SP
Just \$159^{RRP}



Drop Modulation Technology.

Smaller ink drops, about 1/8 the size, are automatically mixed with standard drops to enhance quality.



Layering variable ink densities in each pixel lets you print colours between colours.

5 times the photographic colour combinations.

Optional PhotoRealismTM inks vary the saturation so that a single dot could have 0%, 33%, 67% or 100% of a colour. This produces up to five times as many colour combinations as conventional CMYK inks for better half-tones and less grain.



Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

Canon

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Net anxiety

Virus paranoia

Recently I went into my dad's office in the city to install MSN Messenger on his computer, so that I could message him from home. I was logging onto Hotmail to download the MSN Messenger program when I was informed by the (not very computer literate) network administrator that Hotmail is very, very dangerous and I should not be accessing it on the office network. When I told her that I wanted to download MSN Messenger for my dad, she informed me that I could not download any files at all, because of the great risk of getting a virus.

I have been using the Internet for about five years and have downloaded thousands of files, probably over 10G in total, and I have never gotten a virus. The public is obviously paranoid about downloading anything at all, because they are afraid they might get a virus. In my opinion, this is just sheer naivety. The reports that come from the media certainly don't help.

MSN Messenger would have to be one of the safest downloads on the Internet, but some people are scared to go near it! The media, including magazines like yours, should emphasise that most downloads are very safe, and indeed, there is no need to fear getting a virus from any reliable download site.

David Schaverien
Internet

No skills shortage?

After reading 'No end to skills shortage' (see APC January, page 118), I feel compelled to write and share my opinion about the IT skills shortage.

Like many people, I have seen this shortage reported many times in the media and decided that undertaking training and gaining certification in some facet of the IT industry would be a good means of implementing a career change and eventually bettering myself.

I now find that, in spite of the fact that I have passed the four core exams of MCSE, I am virtually unemployable because, horror of horrors, I have no experience.

I believe I have realistic ambitions. I have spent thousands of dollars and hundreds of hours working towards MCSE and would be happy with nearly

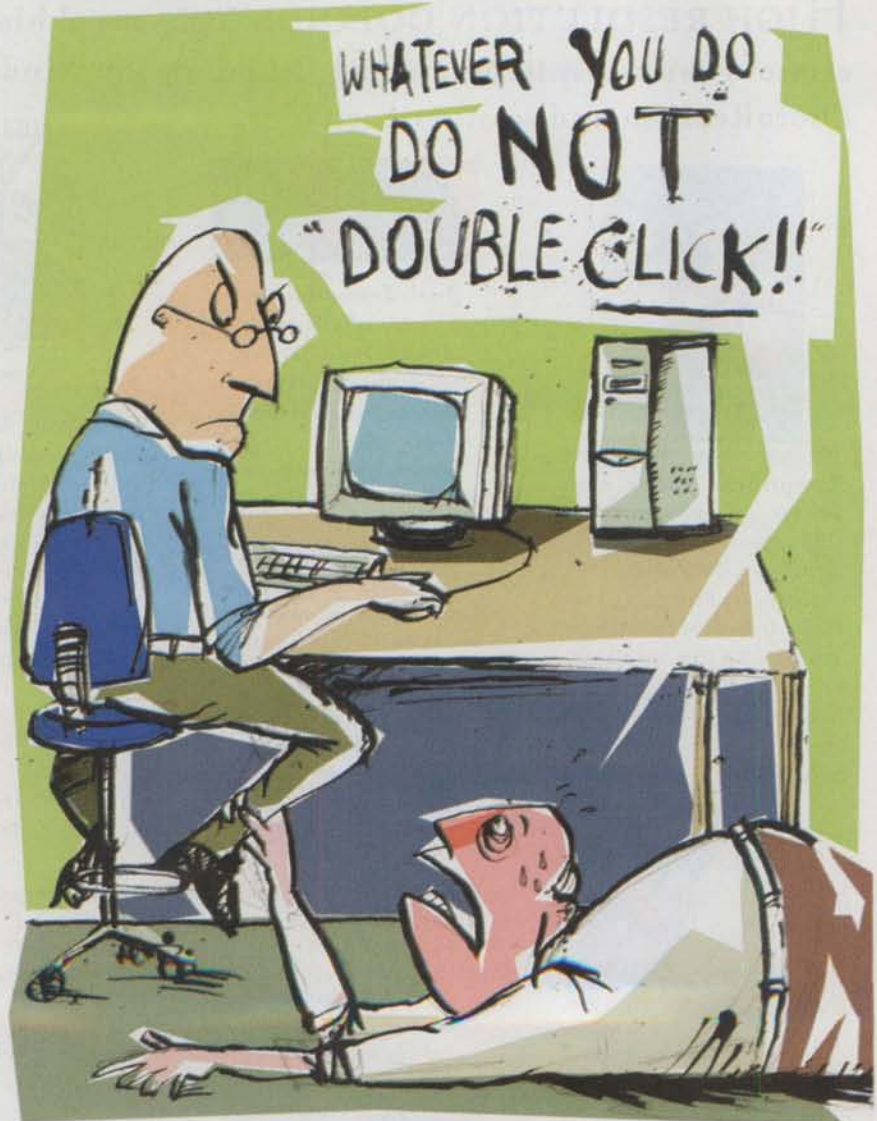
any entry-level position. Unfortunately it seems that, having no previous experience, I have Buckley's chance of even getting a job sweeping the floor of an IT department. My years of experience in other high-tech industries appear to be dismissed as irrelevant.

I have good passes in the exams that I have sat and I have a better than average understanding of and ability with PC hardware. True, I may lack experience and exposure to enterprise-level equipment, but I am stuck in a chicken and egg situation, and I and many others like me seem doomed to stay there until someone decides to commit to a long term solution.

To gain some experience I would be perfectly willing to accept a position on a probationary basis and a reduced pay rate for a period of three months. I am sure that many in my position would do the same.

It amazes me that companies and IT agencies complain about the lack of experienced IT people, but they are unwilling to give any new people a start. The current IT skills shortage is like a game of musical chairs, but with more chairs than players; the music stops and experienced workers can have a seat. In fact, they can have their pick of seats. At the same time, there are a lot of people who would like to play the game, but they haven't been invited to the party

We welcome comments and suggestions. Send correspondence to APC Readers' Say, PO Box 37, Sydney NSW 1028, or email apc@acptech.net. Letters can also be submitted online at apcmag.com. All correspondence becomes the property of APC and is subject to editing.



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**ULTRA HIGH SPEED,
superior operating
economy, whisper quiet
and brilliant quality.
Plus optional 6-colour
PhotoRealism.**

Advanced print head system.

The compact body utilises a dual print head system designed to satisfy the needs of even the most demanding user. Speed, plain paper quality, extra rich blacks, individually replaceable transparent ink tanks plus optional 6 colour PhotoRealism and high definition colour scanning. The BJC™-6200 offers it all, in one of the quietest printers ever.



Superior plain paper print quality.

Standard inks are optimised for plain paper. Resolutions go up to 1440 x 720 dpi. Drop Modulation Technology™ automatically adds variable ink drop sizes and the printer control software defines colour more in line with perceptions of the human eye.



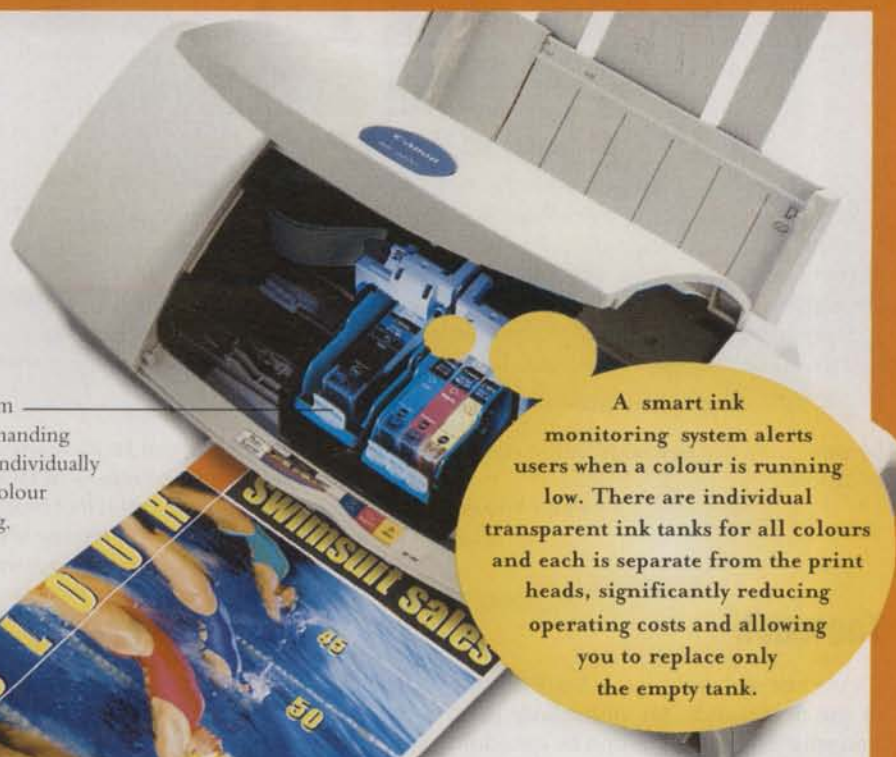
PhotoRealism™ with 6 ink colours for even more tonal gradation.

Optional low density PhotoRealism inks may be used simultaneously with standard density colour inks. The 6-colour system delivers life-like reproduction, especially on higher paper grades. Tonal gradations are smooth even in difficult to reproduce colours such as skin tones and light, glossy surfaces.



Higher speed, blacker black.

A high performance engine with bi-directional printing capable of up to 3 lines per pass results in monochrome text speeds up to 10 pages per minute and colour printing up to 7 pages per minute, making the BJC-6200 easily the fastest printer in its class.¹ Plus the black cartridge employs pigment inks for a richer print density with greater water resistance.



A smart ink monitoring system alerts users when a colour is running low. There are individual transparent ink tanks for all colours and each is separate from the print heads, significantly reducing operating costs and allowing you to replace only the empty tank.

An optional scanner cartridge delivers resolutions up to 720 dpi.



BJC-6200
Just \$399^{RRP}



Built-in parallel and USB interfaces for Windows and Mac².



Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

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Letter of the month



Want to win a Microsoft Office Value Pack? It includes Microsoft Office 2000, the world's most popular desktop productivity suite, and a range of hardware and software for the home and small business: Intel Easy PC Camera, Symantec Norton AntiVirus 2001, GoldMine 5.0 for customer relationship management and a Microsoft IntelliMouse Explorer. It's valued at over \$1,700 and retails for only \$699. The winner of this great prize will be published in APC April. This month's winner is David Schaverien.

because they are new kids in the neighbourhood.

Peter Thorpe
Internet

Too much

I have just seen your latest issue for sale at the newsstands. My immediate reaction was 'no way I'm gonna be spending \$9.80 on a computer mag'. I mean, I used to think twice when your price rose above \$8.

The January issue didn't have much in it either — it seemed to be mainly ads. Another sad thing is that the ads take up page numbers. I once saw your former editor Mr White make a speech in which one of the points he emphasised was the fact that APC, unlike other computer mags, did not artificially boost the magazine page size by counting the ad pages as well. APC seems to be out of touch with its readers if it thinks we haven't noticed this.

Also, I notice discussions do not take place at your Web site as they used to. Are people actually posting here nowadays, or do they just see the new layout and leave?

Tina Barrod
Internet

Ed Note: I know the cover price seems high, Tina, but APC is written and produced by the largest staff of any Australian technology magazine and, unlike some of our competitors, it's all original local content, which is significantly more expensive than recycling copy from foreign magazines.

That's why APC has almost always had to charge a premium over competitive magazines. Then along comes the GST,

resulting in a price rise from \$8.95 — where it had been static for 12 months — to \$9.80.

Fortunately, we're in a market that clearly values quality rather than price, because APC is still by far Australia's best-selling IT magazine.

I think perhaps Jeremy White must have been talking about advertising inserts, because APC — and every magazine that I know of — has always counted general advertising in the book size. Advertising inserts include the catalogues, supplied by companies such as Harris Technology, which are bound into the back of the magazine. Unlike some competitors, we've never included these inserts in the page count.

Glenn Rees

Over site

I was just sitting here, thinking about computers and things, and I came to a stunning realisation. What was once the most useful site on the Internet is now a heap of junk.

What's going on you lot? Where are the message boards? The older articles? The OS/2 section (not that I would touch it, but that isn't the point). It seems to me that if it isn't ninemsn or Linux, you aren't interested in it any more.

Can't we just go back to the way things were, when you guys actually did something useful instead of providing a bandwidth-hungry infomercial?

Name withheld
Internet

PS Alex Kidman, you ROCK!!

Ed note: Don't beat about the bush! Sorry, we can't do much about the ads, because they help pay for the free-access site, but I take issue with the term 'infomercial'. In fact, ask any of our advertisers or business

Subscription prize winner

R J Hodges from Queensland is the lucky subscriber who won a Compaq Presario 1700 series notebook valued at \$4,299 by subscribing to APC in the December issue competition.

partners (including Microsoft and ninemsn) who have been on the receiving end of one of our frank articles, and they will tell you that APC is one of the most editorially independent Australian publications.

Also in our defence, the redesigned site includes nearly all the same sections and regular updates (apart from the likes of OS/2) that featured on the old site. The new site includes archives for each section dating back at least 18 months and, for some Workshop columns, as far back as 1997. The search engine will reveal all these articles.

However, your wish is our command, so we will reinstate the ability to search our really old text-based archives, including the OS/2 articles. And discussion groups are back — see below.

Glenn Rees

Discussion point

The new site design is excellent, but where have the discussion groups gone — those for Windows, OS/2, Linux, etc? Maybe I'm dumb, maybe blind, but I can't find those helpful, hopeful, happy groups anywhere! Hints, please!

Mike Bowie
Internet

Ed note: The discussion section disappeared temporarily with our site redesign and has been missed by many readers. It's now back in a new and improved format, with categories for each section of the magazine (and OS/2). Visit apcmag.com and register to have your say.

Glenn Rees

Conditions of entry

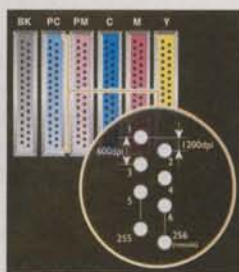
These conditions apply to all competitions in APC February, unless specific conditions are provided with the competition. Instructions on 'How to Enter' form part of the Conditions of Entry of all competitions in APC February. Entry is free and open to all residents of Australia other than employees of APC Publishing Pty Ltd (ACN 053 273 546), suppliers of competition prizes, their families and associated agencies. The contests close last mail February 20. Enter according to the instructions supplied with the individual competitions. The judges' decision is final and no correspondence will be entered into. No responsibility is accepted for late, lost or misdirected entries. All entries become the property of APC Publishing Pty Limited, the promoter, 54 Park Street, Sydney NSW 1028. The prizes are not transferable or redeemable for cash. Any change in the value of the prizes occurring between the publishing date and the date the prizes are claimed is not the responsibility of the promoter. Winners will be notified and their names will be published on apcmag.com.

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ONE MILLION four hundred and forty thousand drops per square inch, 6 ink colours, 4 pico-litre sized drops and 33 tonal levels. Photo printing with zero-graininess image quality beyond the limits of human eye-sight.

Smaller, better ink droplets.

A unique Canon process called MicroFine Droplet Technology™ produces 4 pico-litre ink drops. Using a special star shaped nozzle each droplet is created to be centre-weighted and near perfectly round for more accurate placement.

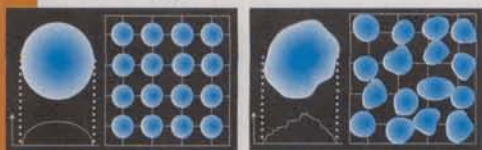


Nozzle layout diagram.



Star shaped nozzle.

High precision dot control.



BJC-8200.

Lower-level technologies.

1200 x 1200 dpi, super low density ink.

Precision placement allows 1,440,000 dots per square inch using inks approximately 1/4 the density of normal inks. This gives an apparent dot size corresponding to 0.67pl of



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SuperPhoto mode, 33 tonal levels.

In SuperPhoto mode the BJC™-8200 can print up to 42 ink droplets per pixel (dot). This allows the printer to achieve 33 tonal levels with zero graininess, even in highlights or gradations where dots are normally distinguishable.



SuperPhoto mode with 33 tonal levels.

Extra large print heads with 6 transparent ink tanks.

There are 256 print nozzles per colour for a total of 1,536 on the print head.

This helps resolve the conflict between speed and quality. Separately replaceable, transparent ink tanks and a smart monitoring system help maximise operating economy.



An optional scanner cartridge delivers resolutions up to 600 dpi.

USB

Parallel and USB interface. Both ports are built-in for Windows and Mac!

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Jeremy Horey

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jhorey@ozemail.com.au.

The cost of video production and the power of the TV networks will impede, but not halt, the development of broadband broadcasting.

Broadband blues

Amid the spectacular spending at the height of the dot com madness, Digital Entertainment Network (DEN) managed to set a record. The company spent \$US60 million to earn just \$US370,000. DEN had an advantage over other dot coms that allowed it to lose money faster than anyone else. It was working with video.

Most forms of content are distributed more cheaply over the Internet. For example, it is much cheaper to publish an online newspaper than it is to print and distribute a physical newspaper. It's also much cheaper to publish a book online than it is to print and sell that book in paper form.

However, there is very little difference in cost between transmitting a show on TV and making it available online. The lower cost of transmission is balanced by the extra cost of preparing the video for the Internet and of streaming it out. It can cost as much as \$US400 to prepare packages of the same video for different data rates.

Producing video-rich content for broadband networks is expensive. The datacasting restrictions the Federal Government has imposed to protect broadcast TV networks mean no-one in Australia will be able to justify the cost of producing video for broadband for at least five years.

This is a shame because broadband delivers a better Internet experience. You don't have to dial in and make a connection — the connection is always there. It's more convenient and encourages ad hoc use for such things as TV guides and transport timetables.

Also, according to Forrester Research, users with broadband access report that sites appear faster, though this difference is small, amounting to about a 10% increase in satisfaction levels. An increase of this size is significant, but on its own it's not

going to encourage dial-in users or novices to take the plunge into broadband.

Forrester Research expects that by early 2001 there will be 5 million home broadband users in the US. Australia has a few tens of thousands. I have no doubt that the lack of local video content, combined with continuing high prices for broadband access, will prevent take-up in Australia progressing at a similar rate to the US.

The TV networks have won this battle against the Internet, but the war isn't over yet, and eventually they will lose. The power of the TV networks depends on their possession of broadcast licences, which are

extremely scarce. If 10 new licences were granted to broadcast TV tomorrow, the networks would have a lot less power. Broadband Internet delivery of video will eventually produce a similar effect.

The power of the networks is also being eroded in other ways. To make money they must sell ads, but tech-

nology is finding ways to protect people from ads. The mute button on the remote control has had a profound effect. The new TV systems that allow users to record and replay action in real time also allows them to screen out ads.

At the same time, the cost of making video content is starting to fall. A digital video camera close to broadcast quality now costs only about \$3,000. Combined with a souped up PC with several gigabytes of storage, you have a makeshift production suite for less than it would have once cost to hire one for a day.

In the long term, the Internet delivery mechanism combined with much cheaper video production will spell the end of the TV networks as we know them. The longer the networks put off adapting to the new world, the more difficult and less effective that adaptation is likely to be. ■

The TV networks have won this battle with the Internet, but the war isn't over yet, and eventually they will lose.

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It fits easily into a briefcase, but offers desktop quality and flexibility. An international power adaptor is standard and a sheet feeder is built-in. IrDA 1.1 plus parallel and USB interfaces for printing from Windows, Windows CE and Mac are standard. Gold standard photographic printing via PhotoRealism™ and a long-life NiMH battery kit are available as options².

Totally cordless operation. Battery packs¹ and built-in infrared (IrDA) interface work with suitably equipped notebooks or PC's to print without needing interface or power cables.



BJC™-50. Ultra small, ultra light, built-in Li-ion battery.

Weighing only 900 grams, the BJC-50 is approximately 1/2 the size and weight of the BJC-85. Using the included battery and IrDA interface it is capable of cordless communications out of the box, and offers a host of performance enhancements similar to the BJC-85.³

BJC-50
Just \$649^{RRP}

Exceptional colour reproduction, automatically.

Using standard inks optimised for plain paper, both printers automatically print high quality images using special functions included in the printer control software. Drop Modulation Technology™ uses variable ink drop sizes to smooth colour and tonal gradations.

BJC-85
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High quality colour, high speed black and white.

A four colour print head with resolution up to 720 x 360 dpi comes as standard. Both printers accept an optional dedicated black ink cartridge with 128 print nozzles for print speeds up to 5 ppm.⁴

Optional colour scanner cartridge for images, fax and OCR.¹

Photo Optimiser adjusts for defects in exposure, highlights and shadows and prints accordingly.



Image Optimiser can "correct" low-resolution Internet images up to the printer's maximum resolution. You can print banners up to 6 A4 pages long, envelopes and overhead transparencies.

Variable ink-drop sizes.

High speed black.

Four-colour print head.



Canon Customer Care.

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Gabrielle Kuiper

Gabrielle Kuiper rides her bike everywhere and works across the science/policy, human/environment, oral/written, advocate/academic, paper/electronic divides in the hope of contributing to positive social change. She can be contacted at Gabrielle.Kuiper@uts.edu.au.

Is Indymedia the future of journalism?

Should it be?

Indymedia

When Eric Beecher, the CEO of Text Media, delivered the ABC's Andrew Olle Memorial Lecture in November, he took the opportunity to lament the decline of quality journalism in Australia. According to Beecher the decline is the result of three pressures: commercialisation, the spin doctoring of the PR industry, and the Internet.

Beecher's comments may be partly true, but the founders and contributors to indymedia.org sites around the world beg to differ about the journalistic disadvantages of the Net. Instead they prefer to emphasise its immense possibilities. The Indymedia movement is the most inspiring development in online media to emerge in the last year. It is 'community media' at its finest, and has proven more than capable of providing the fresh perspectives and insightful analysis so often missing from the corporate 'mainstream' media.

Indymedia originated in Sydney in January 1999 when active-sydney (www.active.org.au) went online as a forum for social change, news, events and group listings in Sydney. The site has since morphed and evolved, and active sites are now live in most major cities in Australia. The open-source, open-publishing software running active allows anyone to post news and information on events and groups without editorial clearance. One click on the submit button and your contribution is online.

Indymedia has become international. seattle.indymedia.org (see APC November 2000, page 76) was born when one of the geeks behind active, Matthew Arnison, suggested that the media centre being set up in Seattle to cover the WTO protests use the active code. The popularity of the Seattle site exceeded all expectations by clocking over a million hits during the protests in November 1999. Thousands of participants' and observers' comments, photos, audio and video reports were added to the site.

People everywhere realised the potential of this apparently simple software and there are now Indymedia sites on four continents in four languages. Eric Beecher claimed that commercialism and a lack of funding are contributing to the decline of journalism, but all the Indymedia sites run on the smell of a burnt-out modem. There is no advertising, no funding, no corporation behind Indymedia.

What's more, it is expanding ideas about what it means to be a journalist. One of the slogans of the Indymedia movement is 'everyone is a witness, everyone is a journalist'.

But is the journalism any good? The sites carry the words of people who are, for the most part, not professional writers, but given the space to have a say, they make passionate, thoughtful contributions and inspiring sites.

The Sydney Indymedia site (www.sydney.indymedia.org), has carried a wide range of stories, including a squatter's description of a midnight police raid and alternative analysis of the Olympics.

Sure, there's no spell-checker and the grammar probably wouldn't meet professional standards, but this gives the stories a personality often missing in the mainstream. Some professional journalists have also been keen to contribute to Indymedia sites, relishing the lack of editorial interference.

At the end of each Indymedia story, readers can add comments. This can create dialogue between readers and writers in a way impossible in other media.

Eric Beecher also said that "journalism is the oil that makes the machinery of democracy go round". If we can have more democratic media, then journalism will surely flourish. Indymedia is not the only solution, nor should it be, but it is an innovation that allows for dialogue and creates the potential for a more conversational style of media. ■

Everyone is a
witness, everyone is
a journalist.

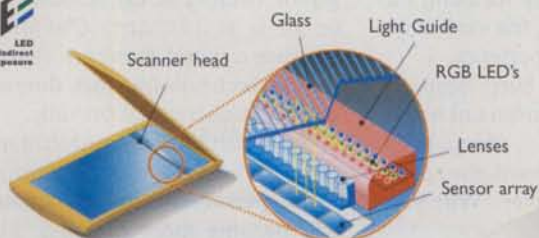
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300 x 600 dpi

CanoScan N340P
Just \$119^{RRP}

Getting started is remarkably easy.

Your scanner plugs directly into the parallel port, or hooks up as the middle link between a printer and your PC. Quick-and-easy CanoScanTM Setup installs the included software, and you're ready to make your first scan with Windows 95/98/2000/NT 4.0.

Full software suite, 42-bit colour input.

The CanoCraft CS-P software works for both stand-alone image acquisition, and as a TWAIN driver for other applications. Advanced controls for colour matching and image definition allows various pre-scan settings such as selecting the scan area and adjusting resolution up to 9600 dpi² with up to 42-bit colour input. The software package also includes ArcSoft PhotoStudio 2000 for photo-editing and Caere OmniPage Pro for converting scanned documents into editable text data, plus a CD ROM with user's manual.

CanoCraft makes high quality colour easy.

42
bit input



Easy to use.

The ScanGear Toolbox (pictured above) lets you select functions and the final destination of your scan such as printer, e-mail program, fax, copy or others,¹ and automatically makes settings for you.



LIDE technology allows a smaller, sleeker design.



600 x 1200 dpi

CanoScan N640P
Just \$149^{RRP}

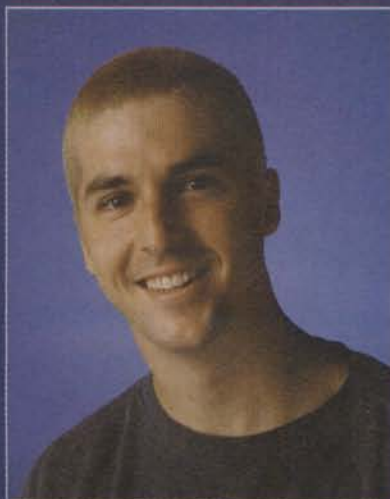
Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



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Derek O'Neil

Derek O'Neil is the managing director of Internet solutions business Indigo Interactive. He can be contacted at derek@indigointeractive.com.au.

Intended to enhance personal contact, the new generation of communications devices has created more ways to thwart conversation.

Breaking contact

You are talking one-on-one with someone. It's an intriguing conversation, the eye contact is strong, you are oblivious to activity around you. Both of you are completely focusing on the moment, the dialogue, the exchange of ideas, emotions and experience.

Then . . . beep, beep . . . beep, beep . . . Incoming communication from unknown third party . . . beep, beep . . . beep, beep . . . Will your companion break the spell? Will your eye contact waver? Will you pause your conversation?

Either way, it's too late. Your train of thought has been broken. Your companion can't help but wonder who sent the message. Is it urgent? Should they have a look?

Their hand goes into their pocket, grappling for the phone. Eye contact is still holding, but you know that it won't last long. You are out of the loop.

The situation gets even worse as your companion begins fumbling with the keypad. There's a furious scramble as a series of buttons are pressed to tap out a response.

The two of you are less than a metre apart, but right at this moment, you are not in the same space.

What is the correct etiquette for this now familiar situation? The basis of good manners is showing respect and consideration to others. It should be obvious that this precludes taking a message or a call in the middle of a conversation, but not everyone is aware of the effect of their actions on their immediate company.

Should manufacturers be responsible for adapting technology further to ensure that good manners prevail? Phones do have features such as meeting

mode or silent mode, which can alert you to inbound messages or calls discreetly. However, you'd be hard pressed to find someone who has not had to endure a phone ringing in the middle of a movie or in a restaurant. Obviously, just because a 'good manners' feature exists in the technology, this doesn't mean correct etiquette will prevail.

As wearable communication devices develop, the issue of good manners while using personal communication devices will become more pressing. Right now there are phones with remote earpieces, Bluetooth technology looks promising, and bionic integration is foreseeable.

Physically embedded communication devices will be great for speaking with remote friends and contacts, but will no doubt be disastrous for maintaining any kind of intimacy in your immediate vicinity.

Presumably a new form of manners will emerge. Just as we teach our children how to say 'please' and 'thankyou', how to eat correctly and not to slurp while drinking, we'll need to teach

them to turn off personal communication devices at appropriate times, turn down the ringer volume in quieter surroundings, and excuse themselves before taking a call if they're already in the middle of a conversation. A whole array of new 'good manners' will be necessary to make up the correct etiquette of engagement with remote parties while in the vicinity of others.

Meanwhile, your friend has finished the keypad finger dance and looks up to resume conversation. "Sorry — where were we?" Conversation begins again, but you know that it won't be long before someone else interrupts with another beep, beep . . . beep, beep. ■

Obviously, just because a 'good manners' feature exists in the technology, this doesn't mean correct etiquette will prevail.

Plug and play USB, push button simplicity 600 x 1200 dpi, just \$189^{RRP}

THE MOST COMPACT flatbed scanner on the market, 600 x 1200 dpi, 42-bit colour input and push button simplicity.

Push button simplicity, unconventionally silent.

A one touch scan button activates ScanGear Toolbox CS (the scanner control software).



It lets you select functions and the final destination of your scan such as colour printout, e-mail program, fax, copy or others,¹ and makes the necessary settings for you.

Edit and store photos easily.

ArcSoft PhotoStudio 2000 is an easy to use image editor, and ArcSoft PhotoBase



creates photo databases. Adobe Acrobat Reader and PDF manuals for Windows and Mac are included.

High powered scanning with LIDE.

Patented LIDE™ technology delivers optical resolution up to 600 x 1200 dpi with 42-bit colour input. ScanGear CS offers direct scanner control and is a universal TWAIN driver for other applications.



It lets you make pre-scan settings such as selecting the scan area and adjusting resolution up to 9600 dpi.²

Plug 'n play USB for Windows and Mac.

The USB interface is compatible with Windows 98/2000 and Mac OS 8.5 or higher³. It lets you plug in or disconnect your scanner without having to turn off your computer first. And, because the scanner is powered directly through the USB cable,



it does not need a separate AC cable.



42
bit input

"Z-lid", advanced OCR.

This special lid simplifies book scanning and OCR with the bundled Caere OmniPage Pro⁴ converting scanned text into editable data.

CanoScan™ N650U
Just \$189^{RRP}

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by

3-YEAR WARRANTY OPTION

Customer Care hot-line support. For more information call 1800 021 167.

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Are you paying your online broker twice the price for little extra service?

Going for broke

Discount online brokers often provide easy and cheap access to the stock market for small investors. However, prices in the fledgling industry vary wildly.

Australia's financial heavyweights — the banks — have been quick to capture the online broking market. Despite community anger over high fees and declining service standards, banks provide some of the most heavily discounted brokerage rates on the market.

It's easy for online banking customers to use their existing savings accounts to invest in the stock market. The benefit to the banks is, of course, more money in

the bank. For example, St George offers one of the lowest brokerage rates — for settlements made to a St George account.

For small investors with the courage to try their hand at do-it-yourself stock market investing, the range of choices is as confusing as it is vast. There are over 30 online brokers operating in Australia. However, this market is smaller than it seems. About half the Web sites offering online broking outsource those services to the handful of companies qualified to execute trades with the Australian Stock Exchange. St George provides brokerage through HSBC, while ANZ has a rebranded E*Trade facility.

For a single first-time trade, a small investor can pay anything from less than \$15 to over \$30. However, despite the substantial price gap, there is little difference in service between nonadvisory online brokers. All online brokers have some form of online stock and market monitoring services, with basic independent analyst ratings or financial indicators.

Online brokers such as Charles Schwab emphasise investor education services, but they remain nonadvisory brokers. The US company coined the 'clicks and mortar' business model, with a mix of shopfronts and electronic communication, but in Australia Schwab's face-to-face customer service amounts to

About Price Watch

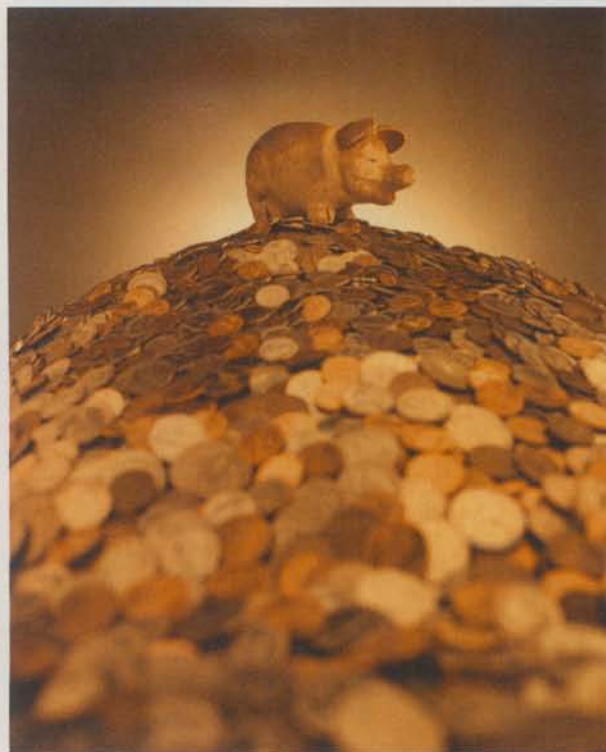
Each month, Price Watch examines variations in retail pricing and service. Investigations are conducted anonymously, either by telephone contact with retailers or through pricing details supplied on their Web sites. Prices and specifications provided here are as quoted by retailers; while we assume these are correct, we cannot accept responsibility for errors or omissions.

only four branches.

Charles Schwab Australia chief executive officer Lynnda Sarinske criticised the big banks for their poor customer service records. However, if you strip away the hype, Schwab is one of the pricier nonadvisory online brokers.

At \$30 per trade, Schwab doesn't provide anything more than rival online brokers. Schwab's interest rate for savings accounts is also well below those of the major banks. Sarinske said the company does not aspire to be a discount operator. "You won't see us start a price war," she said.

One final word of warning about online investing: quality advice from an adviser attached to a traditional broker has saved many from sinking their hard-earned cash into tech disasters like EISA. The April 2000 stock market downturn brought home to many first-time investors the risk of depending on their own knowledge instead of consulting an expert.



Bank	Price per trade	Bulk trading discounts
AMP	\$15.95 for trades up to \$15,000	None
ANZ E*Trade	\$32.95 for trades up to \$30,000	After the first 11 trades in a month, each trade up to \$25,000 costs \$27.45
Commonwealth Securities	\$16.30 for trades up to \$10,000	None
HSBC	\$24.20 for trades up to \$22,000	After the first five trades in a month, each trade up to \$10,000 costs \$11
Macquarie Bank	\$29 for trades of any value	None
National Online Trading	\$27 for trades up to \$25,000	After the first five trades in a month, each trade costs \$13
St George Quicktrade	\$24.20 for trades of any value	After the first five trades in a month, each trade costs \$15.40, and after 10 trades each trade costs \$11 (bulk discount only available for settlement to a St George bank account)
Westpac	\$14.95 for trades up to \$15,000	None

Super high resolution in a super sexy scanner, just \$299.^{RRP}

SCANNER BREAKTHROUGH. 1200 x 2400 dpi, 42-bit colour input and LIDE technology in an ultra compact case.

42
bit input

Semi-professional scanning with LIDE.

Canon's patented LIDE™ was a flatbed scanning breakthrough that changed the price/performance ratio while maintaining image quality and colour clarity. The CanoScan™ N1220U, with 1200 x 2400 optical dpi and 42-bit colour input, demonstrates the evolution of this technology, delivering "semi professional" quality in a super slim, super sexy looking case.



Simple, professional quality software.

The one-touch scan button activates ScanGear Toolbox CS to select functions and the destination of your scan such as colour print out, e-mail program, fax, copy or others,¹ and makes the necessary settings for you. ScanGear CS offers direct control for pre-scan settings such as selecting the scan area and adjusting resolution up to 9600dpi.²

It is also a universal TWAIN driver for applications such as the bundled Adobe Photoshop LE, a limited edition of the world's most popular image editor.



CanoScan N1220U

Just \$299^{RRP}



"Z-lid", advanced OCR.

This special lid simplifies book scanning for OCR with bundled Caere OmniPage Pro⁴ to convert scanned text into editable data.



Edit and store photos easily.

ArcSoft PhotoBase creates electronic photo albums. ArcSoft PhotoStudio allows easy image editing.



Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

Plug 'n play USB for Windows and Mac.

The USB interface lets you plug in or disconnect your scanner at any time without having to turn off your computer first.³ And, because it is powered through the USB cable, the scanner does not require an AC cable.



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A TAXING TIME

The tax reform package was expected to bring about major changes for IT consumers and the computer industry. What has happened in the six months since its introduction? **Stephen Withers** checks the books.

Initial predictions were that the introduction of the GST would see computer hardware prices fall and software prices rise. The removal of the 22% wholesale sales tax (WST) on hardware before the application of the 10% GST meant that its prices should drop. Software attracted no sales tax, so it was expected to go up in price with the introduction of the GST.

However, the widespread practice of bundling software with hardware — operating systems and applications with computers, or games with video cards — meant that not all hardware carried the full 22% sales tax. According to Compaq tax and treasury manager Andrew Watson, the effective rate varied from 12% to 22%. Consequently, consumers didn't see the big price reductions they expected.

Dell was in a different position to other manufacturers as it sells direct to consumers. Consequently, the WST on its products was calculated on a notional wholesale price agreed upon by the company and the ATO. According to Dell corporate communications manager Robert

Small, the introduction of the GST saw its prices fall by up to 16%, with the biggest savings on notebooks and high-end systems. "Our price drops were significantly greater than the average," he said.

The government predicted that the changes to the tax system would lead to savings, and that even previously untaxed goods were unlikely to increase in price by the full 10%. In reality, these savings have been hard to find. Watson said Compaq would search for the savings internally and in suppliers' prices until the end of 2000 at least, but to date there are "not a lot of cost savings at all".

The ACCC classifies computers under the heading 'recreation — audio-visual products' in its price surveys. Prior to the introduction of the GST, the ACCC predicted that prices in this category would drop by 3.1%. The *Report on ACCC price surveys: General Survey, August 2000* found that the actual drop was 4.3%. The report notes, "Prices of computer products were also measured in this group, although difficulties were found

in obtaining a sufficient degree of statistical accuracy. However, the average price changes that occurred were consistent with what was expected."

The survey shows that games prices increased by a smaller amount than other types of software. Why did this happen?

Category	Observed	ACCC
Blank floppy disks	-4.2%	-5.2%
Computer software business/personal (not games)	8.3%	9.2%
Desktop PC	-6.6%	-3.6%
Games software	4.7%	9.2%
Handheld computers	-5.2%	-3.6%
Keyboard	-7.0%	-5.2%
Modem	-3.9%	-5.2%
Mouse	-3.6%	-5.2%
Printer	-7.2%	-5.2%
Scanner	-5.9%	-5.2%
Soundcard	-5.6%	-5.2%
Web cam	-3.5%	-3.9%
Zip drives/SCSI drives	-2.0%	-5.2%

Source: Report on ACCC price surveys: General Survey, August 2000

Combined print and film scanner with USB, surprisingly low \$299.^{RRP}

BUILT-IN FILM SCANNING up to
1200 x 1200 dpi plus high quality photo
scanning in an easy to use scanner.



Easy to use print and film scanner with USB.

The CanoScan™ D660U solves diverse scanning needs simply.

No adapters or add-on kits. Everything is built-in, and is available with the push of a button, one for photos, and one for 35 mm positive or negative film in either slide or roll format. For beginner controls, ScanGear Toolbox lets you select functions and the final destination of your scan such as printer, e-mail program, fax, copy or others.¹ Or, direct driver control lets you adjust scan size, resolution, and other



parameters. The USB interface connects to either Windows 98/2000 or Mac OS systems.²

Superior 35 mm film scanning with VAROS™

Continuous tone colours in film pose challenges. Canon solves them with innovative VAROS technology. The scanner cover includes a built-in back light for film that reaches an extra large CCD sensor. Much like high-speed film, it has a relative light sensitivity up to 4 times greater than many 1200 dpi CCDs. Then VAROS uses two-pass scanning where the second pass is refracted by half a pixel. It activates automatically at resolutions greater than 600 dpi, capturing data that would otherwise be lost on a lesser scanner. The result is 1200 x 1200 optical dpi film scanning in less space and lower cost.



Lamp

CCD

Solenoid

Lens



Push for film scanning

Push for photo scanning



Edit and store photos easily.

ArcSoft PhotoStudio 2000 provides tools for editing photos, and ArcSoft PhotoBase creates an electronic photo database. Also included are Caere OmniPage Pro for OCR³ (optical character recognition), plus Adobe Acrobat Reader and PDF manuals for Windows and Mac.

CanoScan D660U

Just \$299^{RRP}

Canon Customer Care.

The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



Advanced photo scanning and colour capture.

Photo print and text scanning resolution goes up to 600 x 1200 optical dpi with 42-bit colour input capable of capturing more than 4 trillion colours. Data can even be software enhanced to 9600 dpi.⁴

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Director of Microsoft Australia's home and retail division Alan Bowman said that the games market "is more price-point sensitive than the business categories", and that there's a strong resistance to prices over \$100, even for top-quality new-release games. Consequently, publishers and distributors absorbed some of the GST increase to maintain attractive prices.

However, the business market is different. Most GST-registered buyers can claim a credit for the tax paid on purchases. If the total price rose by less than 10% as a result of the GST, the effective price fell for businesses. Like consumers, input-taxed and unregistered businesses have to pay the full, higher price.

The ACCC report also observes that, "Measuring prices on a constant quality basis is an important part of accurately measuring price changes... For example, model specifications for desktop computers change very frequently and often only incrementally, such as when a new product incorporates a larger hard drive. This can result in large numbers of previously priced products becoming obsolete."

This matter was raised in one of the first letters APC received from readers worried about post-GST pricing. To take advantage of predicted price cuts, the reader put off buying a particular computer until July. The manufacturer then promptly replaced it with a new model that had marginally superior specifications at the old price.

Accounts software

Sales of accounting software surged as businesses prepared for the introduction of the GST, but this didn't automatically translate into profitability and sharemarket success.

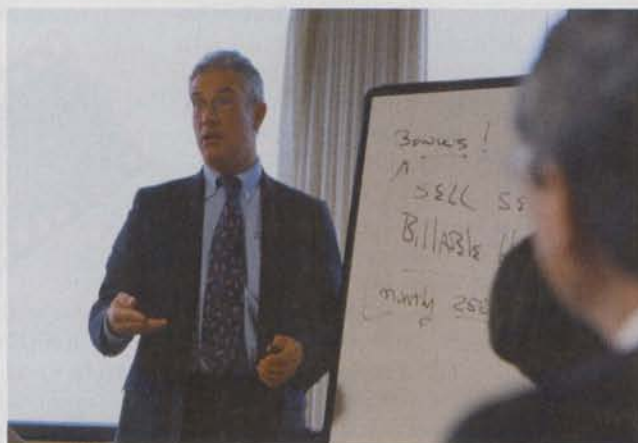
Reckon achieved record sales in the first six months of 2000. Its \$35 million revenue from software sales was almost as high as an earlier forecast for the full year, and was a substantial improvement on the \$19.9 million for the 1999 calendar year. This resulted in a half-year profit of \$37,000, a big improvement on the \$8.11 million loss that had been predicted for the year, this was a big improvement. Reckon realised it had experienced a sales bubble as small businesses switched from using a shoebox to a PC for their tax records, and halved its predicted full-year loss.

However, in October it announced, "The predicted post-GST sales downturn of the Group's core products has been more severe than anticipated." In addition, returns of unsold product from dealers and distributors were higher than expected. Reckon also experienced "severe demands on its

customer support and service functions in the post-GST period, which has required additional resources and costs in excess of expectations". The expected loss blew out from about \$4 million to between \$16 million and \$20 million.

Reckon shares dropped from 68 cents to 29 cents following the announcement. This was a far cry from the \$2.35 it commanded in January 2000, and even further from its peak of \$2.90 on the day of listing in July 1999.

MYOB sales were better than expected in the lead-up to the GST, with operating revenue of almost \$83 million in the six months to June 2000. The figures aren't directly comparable with Reckon's, as MYOB's software is also sold internationally. Local sales fell in July, but according to the company, they were in line with internal expectations. Like Reckon, MYOB



invested in its customer support area, and the headcount grew 85% during the half year. All this translated into an operating profit of just under \$35 million. MYOB shares peaked in late June at \$5.49, and had fallen to \$2.93 by December 1.

Demand varies

As increases in software prices were expected as a result of the GST, many people brought forward their purchases. According to Bowman, Microsoft "saw a surge in sales prior to June 30, but interestingly enough this continued in July and August". This surge was in 'sell through' to real customers, not just sales into the distribution channel. It's possible that the income tax cuts that salary and wage earners experienced almost immediately after the implementation of the GST were a factor in this surge.

"The GST has had a negligible effect in the consumer area," Bowman said. When APC spoke with him in late November, he blamed the flattening in sales during October and the first half of November on a

"post-Olympics squeeze", as people paid off credit card bills run up during the Olympics and prepared for Christmas spending. Microsoft had not yet determined the effect of GST-induced price changes on the business market, he said.

Despite the expectation of lower hardware prices, demand was smoothed by the opportunity to write off the whole cost of systems purchased to implement the GST. Furthermore, hardware prices reacted more quickly to the falling value of the dollar, which accelerated during August before flattening out at about \$US0.52 in November. This was about 14% lower than on the day the GST was introduced. IT imports are priced in US dollars, so this wiped out the GST savings.

Compaq manager of product marketing Tony Ignatavicius said that prices were initially down slightly after the introduction of the GST. The total market grew in the third calendar quarter, despite "a lot of distraction over GST implementation", he said. Many small and medium businesses purchased hardware before July to take advantage of government incentives, but according to Ignatavicius, sales in this market did not fall to the extent expected during the third quarter. More generally, concern over exchange rates and oil prices meant sales did not pick up as expected after the Olympic hiatus. However, in mid-November Ignatavicius

said Compaq was "seeing business picking up again" as companies aimed to complete projects before the end of the year, even though SMEs were still struggling with GST implementation.

Dell's accounting quarter ended on July 31, so it spanned the GST introduction. The company saw a significant increase in sales compared to the previous quarter. Small attributes this to the company's "bold step" of pre-announcing its post-GST prices so that corporate customers would know exactly where they stood. It also "weaned in the GST pricing a little earlier" on consumer products. He said that Dell remains strong in the previously tax-exempt state, local and federal government markets. "We felt the whole GST transition was very smooth," he said.

More recently, Dell has taken advantage of its fast component inventory turnover to cut prices. "Component prices are falling faster than the Aussie dollar," Small said.

Some IT traders reported a 'buyers' strike' during the first quarter under the new tax regime. John Groves is managing director of Metek Interstahl, an independent Apple

Exceptional quality for graphics, design and web work, just \$499.^{RRP}

ADVANCED CCD, 1200 x 2400 optical dpi, fast Galileo Lens, full 42-bit colour and optional high intensity film adaptor unit.



Galileo
Aspherical lens.

High-speed Galileo Lens, advanced CCD, more optically accurate.

Superior performance begins with Canon's optical expertise. The five-element, aspherical lens system eliminates distortion. A shortened optical path and wide aperture lens (f-stop=5.5) increase scanning speed and improve signal to noise for a more optically accurate system. A true 1200 dpi CCD sensor is capable of finer detail and more accurate colour than "hit or miss" interleaved CCD approaches used by some competitors.



ScanGear Toolbox CS offers
"point and click" simplicity.

So advanced, so simple.

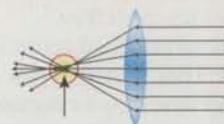
The easy to use unit delivers studio quality 1200 x 2400 dpi optical resolution for almost the same price as many 600 dpi scanners. The USB interface connects to Windows 98/2000 and Mac OS systems.¹



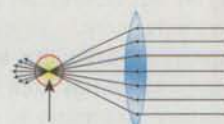
Full 42-bit colour.

True 42-bit input and output increases subtle tonal variation and colour accuracy. Photoshop 5.0LE, one of the few

applications capable of handling 42-bit colour, is included. Advanced controls cover gamma settings, histogram adjustment, colour curves and more.



Spherical aberration —
Light converges at different points.



Galileo Lens — Light converges at
a single point.

Optional FAU-S11 film adaptor,² \$199.^{RRP}

High intensity film adaptor.

The optional film-scanning unit replaces the standard cover for reflective and film scanning, and matches or exceeds the performance of expensive moving light source designs. The light source in the cover uses dual sheets of 3M™ BEF film (Brightness Enhancement Film) plus dual, high-intensity cold cathode fluorescent lamps for maximum brightness. It accepts colour negatives and positives in 35 mm, 2 1/2" and 5 x 4" sizes.

Full software suite.

ScanGear control software, a universal TWAIN driver and Photoshop LE are included for Windows and Mac. Caere

OmniPage LE for OCR is included for Windows. Caere

PageKeeper for Windows and Caere ImageAXS for Macintosh create and access visual data bases.



Canon Customer Care.

The one-year warranty is upgradeable to three years or a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.



CanoScan™ FB1210U
Just \$499^{RRP}

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reseller that deals mainly with small businesses in suburban Melbourne. He experienced a dramatic downturn in sales in July. Many customers said they were putting off all nonessential purchases until after they had lodged their first business activity statement (BAS) and had seen how GST and PAYG (pay as you go) remittances had affected their cash flow.

"Things just dried up totally in July and August. They started to pick up in September, and were close to normal by October," Groves said. "Clearly some small business people changed their minds and purchased before doing their BAS. I can only assume holding off was having too great an effect on their productivity."

Suppliers' observations were generally borne out by findings from industry analysts Gartner. According to analyst Andy Woo, PC sales were down 4% in the second quarter of 2000, on a year-on-year basis. "There was strong evidence of delayed purchases" on the corporate side, and "sales were mainly driven by SMEs and the consumer market," he said.

"In the third quarter, growth of the PC market was strong, with a year-on-year growth of 11.2%," Woo said. "However, the expected large-scale procurement from corporations did not prevail, as the segment actually recorded a negative year-on-year growth. Consumers and SMEs drove the market once again."

Gartner found that due to component shortages, already-tight margins and adverse currency movements, PC prices were only marginally cheaper with the introduction of the GST. By the end of the year, some of these factors had eased, and Woo predicted a strong finish to 2000.

SMEs

Prior to the implementation of the GST, it was clear to anyone visiting retail outlets such as Harvey Norman and OfficeWorks that many small businesses were buying the heavily promoted accounting packages from MYOB and Quicken as part of their GST preparations. However, retailers weren't clearing their stocks and when they returned their unsold inventory, the software developers' results suffered.

My own business switched from manual to computerised bookkeeping to help deal with the GST. The \$200 government voucher was exchanged for a copy of QuickBooks, and after a lot of time and effort, the first BAS was lodged punctually. Administration time has doubled, but it would have been even worse if the business had stayed with a paper-based system. Properly set up, QuickBooks speeds BAS preparation and the generation of debtors and other reports.

The concerns Groves highlighted about cash flow are not only reducing discretionary sales. Some businesses have adopted a deliberate policy of withholding payments for as long as possible to conserve their cash balances for BAS instalments. One small business operator told APC that it is becoming harder to pay bills on time when receivables had blown out from three to four months' sales since the introduction of the GST.



The ATO perspective

The ATO reported "an overwhelmingly positive response to lodgement of the July business activity statement" and acting tax commissioner Bruce Jones said, "I want to congratulate Australian business on a job well done in meeting the first big test of the new system." However, as monthly lodgement is only required from businesses with an annual turnover in excess of \$20 million, you'd expect them to get it right.

By mid-November, almost 280,000 of an expected 290,000 monthly BASes had been lodged. This figure was described by tax commissioner Michael Carmody as "better than past monthly remittance patterns for PAYE where nonlodgement was typically around 10%".

At the same time, he said that approximately 1 million of the expected 1.6 million first quarterly BASes had been lodged. The last of these were not due until the end of the month. "This is a terrific achievement for Australia, reflecting all the hard work business people and their representatives have put into making the New Tax System a success," he said.

BASes can be lodged through the Internet, but few have taken up the option. At the beginning of December, only 53,000

businesses — about 3.5% — had used this method. However, this number was increasing by 400 per day, according to assistant commissioner of GST computerisation John Higham. About 200,000 businesses chose this option when they registered for GST, but only 76,000 had downloaded their PKI keys and certificates. "A lot of people ticked the box without really thinking," he said. A campaign to boost electronic self-lodgement is expected, and other taxation transactions will be built on the ATO's public key infrastructure, which Higham described as probably the most advanced in Australia.

In his CPA Australia/Australian National University annual research lecture, Carmody foreshadowed a system "whereby all a small business would need do to meet its tax obligations would be to operate a special purpose account with its financial institution. Under this scenario, the account would constitute its tax records, and returns and remittances (including BAS remittances) would be generated electronically". Sceptics might wonder about the fees the financial institutions would charge for these arrangements.

The ATO expected the new tax arrangements to help in its crackdown on computer wholesalers that were evading tax, but there has been no comment about its success in this area.

Looking ahead

Without underestimating the effort involved, the introduction of the GST seems to have passed reasonably smoothly. Some believe this is because Australians expect the worst and consequently overprepare. Y2K and the Olympics were touted as disasters in the making, but Australia passed both tests with flying colours, and the same goes for the GST.

It's still too early to tell whether the predictions of widespread GST-induced business failures will occur, but most businesses seem to have their systems in place. Similarly, consumers are coming to terms with the changes in prices.

Despite efforts by the government to ensure that cost savings due to tax changes are passed on, it seems the IT industry is struggling to find them. Perhaps the most important issue still unresolved is whether the impact of the GST on inflation was a one-off spike (as the Government predicted) or a price-wage spiral. It's possible that ongoing competition (rather than the threat of fines) will encourage businesses to uncover and pass on any savings during 2001, and the resulting price cuts — or at least smaller price rises — may help keep inflation down. ■

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Two weeks after the April 2000 technology stock crash, the chairperson of an Internet startup moved to reassure anxious shareholders. "We definitely see brighter times ahead of us," he said. It was his first and last annual general meeting.

Billions had just been wiped off the value of technology companies, but he promised that the company had "sufficient resources to continue operational funding of our existing businesses for at least the next 12 months".

Seven months and a string of business failures later, the dream was dead and creditors were picking over the remains of the company. It wasn't that shareholders

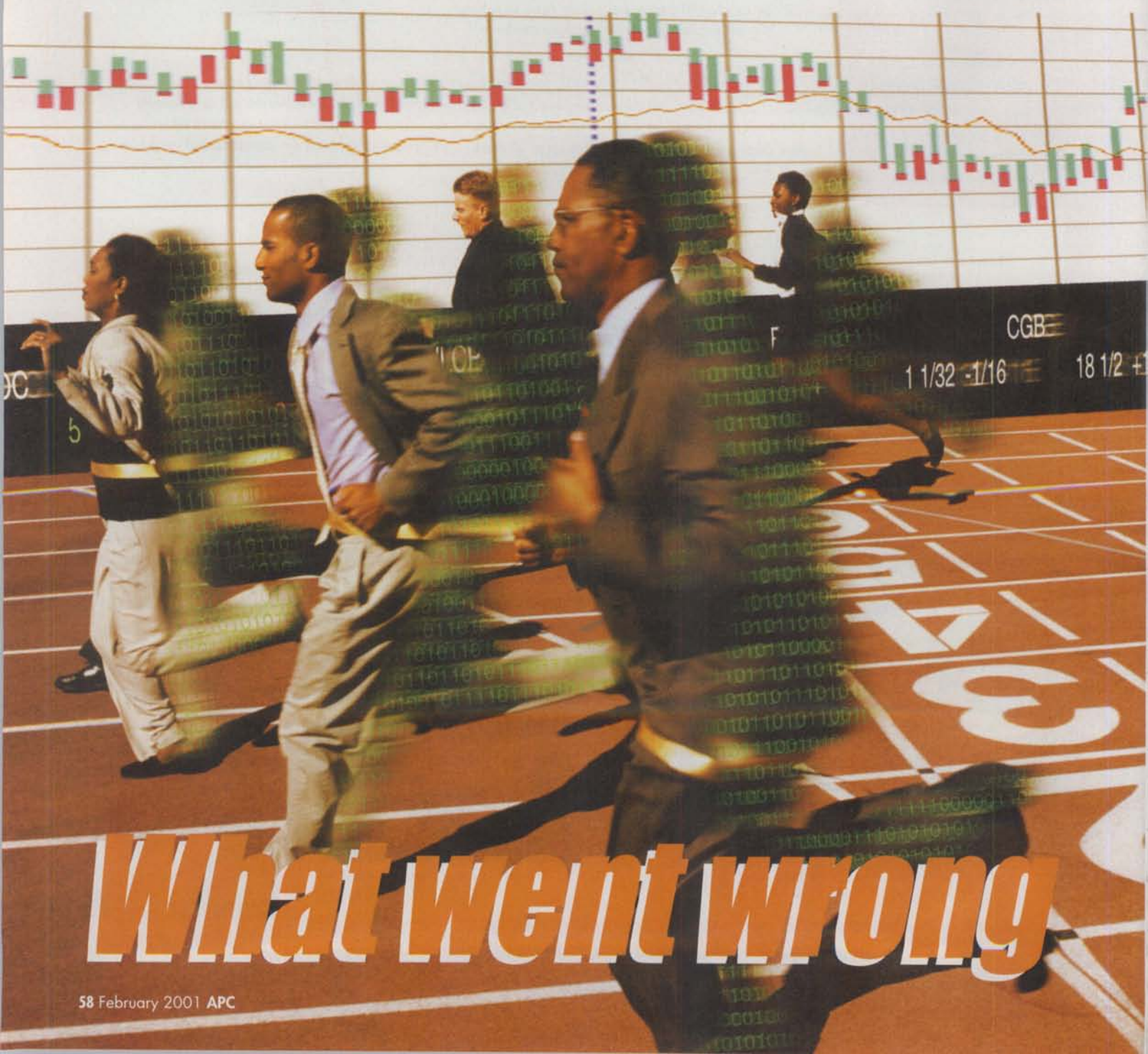
had wrongly placed their trust in some brash young Internet executive. The reassuring words had come from Nicholas Whitlam, long-time professional company director and head of the NRMA, one of Australia's oldest institutions.

When Whitlam signed on to lead LibertyOne, he was counting not only on the exponential growth of the Internet, but on a similar capacity for dot coms to make money. Like many gripped by dot com mania, Whitlam was caught up in the optimism that accompanied most Internet ventures in the year leading up to the April 2000 stock market crash. He bought 1 million LibertyOne shares personally, so when he promised shareholders that

everything would be OK, he must have believed the company was on the verge of something big.

LibertyOne was one of an exclusive group of companies born into a market where dot coms could raise so much cash from investors, they were not required to make money from their business. Dot coms could rely on the stock market or eager angel investors for funding. These investors believed that dot coms were poised to cash in on a market that was about to explode. They were looking to make fast returns for little time and effort.

The Internet boom was a wild ride that paid off for investors who knew when to quit — to take their money and



What went wrong

run. However, inside the Internet companies themselves, executives had to come to grips with businesses that kept burning cash but generated little revenue. Without the possibility of raising more cash on the stock market or through venture capitalists, many dot coms were in serious trouble.

Suddenly, Australia's dot com pioneers became infamous for the amount of money they had wasted in such a short time. Without the Internet optimism to prop up their failing businesses, the darlings of Australia's 'new' economy had to seek other ways of staying alive.

Once-famous names like LibertyOne, EISA, Satellite and dstore were trans-

formed into quintessential case studies of Australian Internet failure.

Whitlam was forced to look on as assets that were once worth nearly \$1 billion were flogged off by administrators for next to nothing. He followed the growing line of failed dot com executives, retreating from a once-glamorous role in the 'new' economy back to the 'old'. His reputation was tarnished by his links to Australia's longest running dot com disgrace.

LibertyOne

As chairperson of Australia's first listed Internet company, Whitlam thought he was onto a sure thing. Optimistic that the general 'Internet content' business was poised to cash in on the new economy, investors had sunk \$40 million into LibertyOne's initial public offering.

However, LibertyOne was never able to turn a profit from the Internet and only ever made money from unwary investors who believed the company's hype.

When administrator John Gibbons from Ernst & Young was finally called in to mop up in December 2000, LibertyOne had only \$1 million left in the bank. A long line of CEOs and a string of failed deals had left the company with a share price of just 6 cents and a raft of unpaid debts.

This was a far cry from the early days of 1999, when LibertyOne rode the first wave of market enthusiasm for technology companies. LibertyOne was the first dot com to cash in on the boom in technology stocks, floating on the Australian Stock Exchange (ASX) in December 1998. At its issue price, LibertyOne was valued at almost \$156 million.

For more than a year, LibertyOne rode the wave, bolstered by an inflated share price and unrealistic investor expectations. LibertyOne appeared to be a solid Internet company, boasting a stake in successful Web developer Zivo and an alliance with well-known Internet brand Excite. NRMA

deputy chairperson Denis Cleary joined Whitlam on the board, along with TV personality Kerri-Anne Kennerley.

From the start, boardroom turmoil dogged the company. Four months after its debut on the ASX, founding CEO Don Hagan quit and a dispute over severance pay dragged on for more than a month. Former News Ltd manager Warren Lee stepped into the role, immediately expanding LibertyOne's global operations with offices throughout Asia and in Los Angeles.

In June 1999, LibertyOne offloaded its alliance with Internet company Excite for \$8 million, bolstering its cash reserves and diverting attention away from its alarming cash burn rate. In the months leading up to last year's April stock market crash, LibertyOne purchased a string of precarious Internet startups, a spending spree that haunted the company in the following months as one by one each venture began to topple. When administrators attempted to determine what assets could be salvaged for creditors, they found a complex web of about 30 subsidiaries.

For shareholders, the danger signs began to appear in September 1999 when LibertyOne revealed its first annual financial results, posting losses to the tune of \$36 million. Despite the shock loss, investors continued to inflate the share price, which was yet to reach its highest levels.

However, directors could see the writing on the wall. The company pursued two rescue strategies: raising extra capital and merging with another company. In September 1999, Lee announced an ambitious plan to raise up to \$70 million by floating LibertyOne on Nasdaq by the end of the year. At the same time, Lee began confidential merger talks with Asian Internet portal Chinadotcom.

In October the negotiations collapsed and Lee was dumped as CEO. Managing director Graham Bristow immediately

*The meteoric rise of a select group of Internet companies has only been matched in drama by their spectacular demise. **Fiona Angus** traces the events surrounding the downfall of Australia's dot coms.*

with the dot coms?

stepped into the role, shrugging off missing prospectus forecasts and the Chinadotcom debacle. Bristow was counting on a successful debut on Nasdaq.

A series of delays over the Christmas period set the Nasdaq listing back, but Bristow remained confident of raising the extra capital from a market still eager to hand over cash to Internet ventures. LibertyOne stock was at its highest point ever, peaking at \$2.56 in October 1999. In February 2000, Bristow went to the ASX to raise an extra \$17 million to fund the ongoing operations of the business.

Then market sentiment began to shift and Nasdaq was put beyond LibertyOne's reach. The company was hit hard by the stock market crash; on Friday April 14, LibertyOne's share price closed at 70 cents, on Monday April 17 it closed at 45 cents.

Bristow continued to look for an entry into the US stock market. In July 2000, a merger with listed US firm CyberSentry appeared imminent. The alliance would provide LibertyOne with a new source of funds and a back door into the US market. LibertyOne already held a stake in CyberSentry through a series of complex

LibertyOne

agreements. Directors eventually rejected the takeover offer as inadequate and Bristow departed amid allegations of dubious dealings with CyberSentry. It was a bitter blow for Bristow, who had acquired a large stake in LibertyOne.

Former NRMA manager Marcelle Anderson was brought in to straighten out the troubled company, but ended her reign by overseeing its final collapse. LibertyOne's death appeared close in September when the half yearly financial report revealed a massive \$58 million loss. LibertyOne had previously promised a profit of over \$7 million for 2000.

However, in a stunning turnaround a last-minute rescue package valued at \$34 million was suddenly offered by mystery Hong Kong Internet 'incubator' iReality. The unknown company had links with LibertyOne executive Matthew Burlage and immediately forked out \$500,000 to keep LibertyOne afloat.

Two weeks before LibertyOne was placed in the hands of administrators, the new management was promising "concrete signs of a turnaround", but it was too late. Even with the extra funding from iReality, LibertyOne could not pay its debts. In the end, it was Whitlam and Kennerley who called in administrators.

iReality slammed the decision to wind up the company, but accepted the company's dire financial position.

Sofcom, a small software company headed by Jeff Kennett, paid a "nominal" amount for what was left of LibertyOne's only worthwhile asset, Zivo. For a reported \$50,000, Sofcom acquired Zivo's trademarks, software, licences, intellectual property, URLs and Web site, and had first choice over staff and any remaining projects.

The final collapse occurred just days before Bristow's shares were due to come out of escrow, robbing him of any return on his investment.

dstore

LibertyOne wasn't the only company in trouble. On November 2, 2000, dot com hopefuls flocked to hear David Gold give advice on 'managing the burn' in an Internet venture. He was the star attraction at a venture capital forum backed by the likes of James Packer and Rodney Alder. On December 1, Gold's own company had run out of cash and was on the verge of collapse.

It was a bitter pill for Gold, who for more than a year had been held up as the darling of Australia's dot com sector. He had successfully raised \$35 million from private investors to set up Australia's most successful online retailer, dstore.

Gold established his dot com credentials as an executive at LookSmart, but left before his 30th birthday to found dstore in October 1999. He immediately set about establishing dstore as the top online retailer in the country, splashing out on an expensive television, print and online advertising campaign and setting up a state-of-the-art fulfilment operation.

When dstore proved unable to turn a profit, Gold began looking for extra cash to continue operating the business.

He was desperate to go ahead with floating dstore on the ASX. He had originally planned to raise up to \$200 million from an initial public offering, but had held off after finding a ready source of private investors.

However, even private investors were now too scared to sink more money into an unprofitable Internet business. For Gold, a float under such harsh conditions was out of the question.

The Christmas retail rush was drawing near, but even with reported revenue of \$3.5 million per month and over 100,000 visitors a week, Gold could not entice new investors. Existing investors such as ninemsn, LookSmart CEO Evan Thornley and TiNSHED (the venture capital firm that had invited Gold to speak the month

before), were unwilling to prop up the expensive operation. To raise the cash, Gold considered spinning off dstore's Asian operations.

The market had become wary of pure Internet businesses after local rival TheSpot collapsed in late June. Part-owned by Amazon.com and Fairfax's online arm f2, TheSpot sold out to David Jones, which integrated its infrastructure into the David Jones online venture.

In the end, Gold sold dstore to clothing retailer Harris Scarfe for just \$3 million. About 15 staff were immediately given their marching orders and the remaining business was added to Harris Scarfe's network of 35 department stores around the country. dstore's string of high-profile angel investors posted an enormous loss and received consolation shares in Harris Scarfe.

At the time of the sale, Gold claimed the venture was just four months away from turning a profit.

EISA

When Evan Rees faced shareholders at EISA's first and last annual general meeting in June 2000, he knew the company was in serious trouble.

"The future of EISA lies in a merger with another company," he told bewildered shareholders. However, the situation was even more dire than Rees let on. Shareholders were not aware that at any moment their company could become insolvent. As chairperson of EISA, Rees was in breach of Corporations Law by continuing to operate the business when the company could no longer pay its debts.

Sitting beside Rees at the meeting was the architect of EISA's downfall, CEO Damien Brady. In February, Brady brokered a deal to make EISA the biggest ISP in Australia by purchasing second-ranked OzEmail. The deal would increase EISA's subscriber base from 65,000 to almost 500,000. To close the deal, Brady needed to raise around \$350 million. EISA held cash reserves of just \$35 million, left over from the \$57 million raised when the company floated on the ASX in August 1999.

EISA was set up by failed PC maker Johnson Wang in 1996. At the same time that EISA was spinning out of control, Wang's private company Edge Computers was in the middle of a messy collapse. On the day of the annual general meeting, Wang, a director of EISA, fled the country and was thought to be hiding out somewhere in China or Hong Kong.

The young and brash Brady managed to lure some high-profile investors into

the OzEmail bid. By April he had secured a total of \$180 million from Fairfax's Internet arm f2, the ANZ Bank, Hastings Funds Management and Disney, with each agreeing to take equity in EISA.

Then disaster struck. In the middle of negotiations to secure the funds, the stock market crashed and EISA was suddenly worth much less. Fairfax immediately pulled out of the deal, which depressed EISA's share price even further. On June 1, OzEmail's parent company UUNet formally rejected EISA's offer. "Under the agreement EISA was required to have financing commitments in place last month. It is clear that EISA is not in a position to meet that requirement," UUNet officials said. Investors rushed to dump shares in EISA, and the share price hit a record 25-cent low.

However, worse was to come. EISA had paid a \$20 million deposit to UUNet under a business sale agreement and UUNet had no intention of handing it back. The remaining investors now retreated and EISA was left standing alone, without the cash to pay telecommunications costs to Telstra, Optus and Primus.



After the meeting with shareholders, Brady was dumped from the board. Having engineered the OzEmail debacle, Brady was now accused of misusing company funds for personal entertainment. With EISA facing complete collapse, Rees recommended that shareholders accept a takeover offer from regional pay-TV provider Austar.

Shareholders would not listen. They had watched EISA's shares soar to \$3.18 in February, and Austar's offer of 20 cents a share seemed like chicken feed. Over the following weeks, Rees begged shareholders to accept the offer. Austar extended the deadline several times, but final acceptances fell short after regional television WIN reportedly refused to relinquish its 3.5% shareholding.

With no other 'serious' offers on the table, Rees called in administrators to carve up the remaining assets of the company. "There will be no return for shareholders," Ferrier Hodgson administrator Andrew Love said. "Ultimately, shareholders chose not to go ahead with the takeover. That's the hard reality."

Love told creditors they could only hope to recover about one-third of what they were owed. Austar stepped in to buy EISA's

remaining assets for just \$13 million, almost half what it was originally willing to pay. It was a major victory for Austar.

After investigating the circumstances behind the collapse, Love concluded that EISA directors had illegally continued to operate the business while it was insolvent, that is, from the time the OzEmail deal fell through in May until Austar stepped in with a rescue package in mid-June. Love handed over the results of his investigation to the Australian Securities and Investment Commission (ASIC), which will decide whether to charge directors with insolvent trading.

Meanwhile, police are reportedly investigating Brady's personal expense account.

Satellite

Satellite was also on the ropes. The bitter infighting that marked its downfall finally attracted the wrath of the head of ASIC, David Knott.

In December, ASIC launched a full-scale investigation into Satellite executives Greg Fisher and Jonathan Broster. Knott alleged the two founding shareholders of the gay Internet services company "failed to act in good faith".

"We allege that they used their positions to gain an advantage for themselves at the expense of Satellite by causing approximately \$1.9 million to be paid from the company to companies related to them personally," he said. ASIC is seeking to impose civil penalties and intends to ban the two from ever managing a company again. Fisher and Broster are facing a \$200,000 penalty on each charge, the same amount the company is now worth.

Satellite floated on the ASX in September 1999, painting itself as a 'pink float' and the first gay services company in the world. It successfully raised \$25 million from the initial public offering and Fisher and Broster both scored an 18.65% stake in the company.

As managing director, Fisher planned to set up Gay-O-L, an Internet portal aimed at the gay community. Satellite already controlled around 80% of the gay media in Australia and Fisher thought he could attract 120,000 subscribers to the site. The site was scheduled to open in February 2000, in time for the Sydney Gay and Lesbian Mardi Gras. After this Fisher planned to take the site to a global gay audience. "This portal will be the first port of call for any gay or lesbian looking for services, products or information that exhibit an understanding of their lifestyle and their view of the world," he said.

However, Satellite did not have

enough money to get Gay-O-L off the ground. A week before the April stock market crash, the company tried unsuccessfully to raise an extra \$10 million on the ASX. Satellite's share price remained consistently low, limiting its ability to raise the cash.

In June, the company took the drastic step of attempting to bolster its share price by informing investors of the value of its assets. "The company wishes to state that the current share price does not in any way reflect the true net asset position of the company," Satellite stated. "The company is fundamentally sound and the directors believe that the share price will recover."

It didn't. Fisher clashed with Satellite chairperson and president of the Australian Medical Association Kerryn Phelps over his handling of the struggling business.

At the same time, Broster staged a strategic exit from the company. He sold his shareholding to listed Hong Kong investment company the Millennium Group in late June, which paid over \$3 million for a 19.9% stake in Satellite. Despite this minor success, tensions between Fisher and Phelps spilled into the public arena. Phelps asked ASIC to investigate Fisher and Broster's dealings.

In early July, Fisher was ousted as managing director and Phelps suspended all trading of Satellite shares. Fisher criticised "the vast array of allegations and innuendo that have been levelled at me. I have no intention of sitting back and being publicly denigrated." He attempted to regain control of Satellite through his major shareholding, but even with a number of boardroom allies (including his father) he was unsuccessful.

Phelps insisted the company was still a viable operation, but a receiver was appointed to some of Satellite's property assets. In August, Phelps staged a boardroom showdown with the remaining directors and attempted to place the entire company into receivership. However, she couldn't muster the necessary numbers and resigned as chairperson.

Two months dragged by, but with management in disarray and funds running low, the company was handed over to administrators in November. Property developer Ian Widdup offered just \$200,000 to buy 90% of the failed company — a far cry from the \$35 million value the company placed on its Web portal in March 2000. In desperation, creditors voted to accept the offer.

As EISA's administrator commented, the real value of a dot com comes down to what someone is willing to pay for it. ■



In transit

*Mobile phones are changing the face of Australia, but do we like the new look? **Suzanne Fraser** weighs up this increasingly popular technology.*

Anne Summers has described the mobile phone as "both a status symbol and extraordinarily utilitarian". A tool that is transforming space and work, the mobile phone is also a popular vehicle for self-expression. At least 45% of Australians now carry a mobile phone, and the technology is having an enormous effect on Australian society.

Convenience is the main drawcard for mobile phones, and in urban areas they deliver this very well. However, not all the changes mobile phones have brought are positive. A relatively young and immature technology, the mobile phone is being shaped by different forces. Its safety is still being debated, and the government, the consumer market, the rural sector, the disabled and others all have an interest in moulding the technology to suit their needs and concerns.

Safety

The effects of the electro-magnetic radiation emitted by mobile phones are still not fully understood. Recent scientific research, and the Stewart Inquiry Report released in Britain in May 2000, found no evidence of health risks associated with mobile phone radiation. However, many agree it is too early to be sure. Data from long-term studies based on humans do not yet exist, so scientific studies have used animal subjects and extrapolated the data to humans. This form of research carries concerns about accuracy and relevance.

Still cautious about the question of mobile phone safety, Sir William Stewart, the head of the Stewart Inquiry, noted that evidence of danger could still emerge in the future. He also said that "the widespread use of mobile phones by children for non-essential calls should be discouraged".

In a similarly cautious mood, the Royal North Shore Hospital issued an occupational health and safety policy last year advising its staff to avoid using mobile phones. Professor Norbert Berend, the executive director of the hospital, described the policy as a "precautionary approach". Although the safety of mobile phones remains in doubt, according to Australian scientists, mobile phone manufacturers are not as open about the results of their safety research as they could be.

Spectrum

This doubt over the safety of mobile phones casts the Federal Government's auctioning of mobile phone spectrum in a dubious light. Attracting higher and higher prices, spectrum has the capacity to earn the government a lot of money. In March 2000, the government made a record \$1.33 billion on spectrum auctions. That's four times as much as it made in the previous auction in 1998. The sale of third-generation spectrum in 2001 is likely to dwarf even this impressive sum. If Australian prices follow those reached in the UK, bidding could reach \$19 billion between the three carriers — Telstra, Cable & Wireless Optus and Vodafone.

This would be an enormous revenue boost, and one that has the power to alter the government's political fortunes. The revenue garnered from the March 2000 spectrum sales was used to help balance the budget. Imagine what an injection of \$19 billion could do for the government's image.

Of course, if carriers pay more for spectrum, their overheads increase and the costs are passed on to consumers. From this point of view, the sale of spectrum looks rather like an indirect tax on mobile phone use. However, unlike income tax,

this tax makes no distinction between affluent users and those on low incomes.

Some argue that mobile phones are a luxury, and that the inability of sections of the community to afford them is insignificant. This view ignores the increasing role mobile phones play in access to employment and other social advantages, and risks consigning sections of the community to the wrong side of a 'digital divide' similar to that created by the Internet (see *APC* August 2000, page 68). In fact, if data speeds on mobiles increase sufficiently, access to the Internet through WAP will blur the distinction between the two technologies, and the digital divide will be compounded.

In any case, the costs associated with spectrum purchase won't be carried by mobile users alone. They will become embedded in business costs and get passed on to all consumers through product and service prices.

The bush

The spectrum 'windfall' must also be weighed against the adequacy of the new CDMA (code division multiple access) digital networks in rural areas. As carriers are unwilling to service low-traffic rural areas, the government may need to consider subsidising mobile networks in areas that lack coverage.

For farmers, the mobile phone is definitely more utility than status symbol. Farmers were not happy with the demise of the old analog network. Despite the hype, the new CDMA network does not have the coverage of the old network, which delivered fortuitous as well as official coverage. The term 'fortuitous coverage' refers to the coverage subscribers received in areas outside those officially serviced by the network. It was usually the result of advantageous location and topography.

As the analog network was being phased out, farmers found that large areas of NSW had no coverage at all. The chairperson of the NSW Farmers Association Rural Affairs Committee Mal Peters underlined the importance of mobile phones to rural communities as the phase out was taking place. "It's amazing the way that mobile phones have changed things for people living in rural areas. Rural business is time critical and dependent upon good communications, just like other areas. It's imperative, if we are to remain competitive with overseas producers, that we have equitable access."

Rural uptake of mobile phones has had several effects on rural life. Not only has it broken down some of the isolation farmers experience when working on distant parts of their properties, but it has raised expectations about how their business should be conducted. The mobile phone has also improved farm safety by improving communication. Understandably, farmers feel that their needs should be taken into consideration as the technology continues to develop.

Farmers are not the only ones at risk of being left behind as mobile phone technology changes. People with disabilities and the aged also use mobile phones, and



the deaf are particularly enthusiastic users of SMS (short message service) technology. At the Consumers' Telecommunications Network (CTN) conference in November, Christopher Newell of the National Caucus of Disability Consumer Organisations emphasised the need to maintain deaf people's access to the technology. He said that aspirations to turn SMS messaging into a voice-activated technology, producing voice-rendered messages, would destroy the technology for the deaf. Another contributor suggested that the government should oblige carriers to provide services for the disabled as part of their contracts. The concerns expressed by farmers and the disabled reflect the fact that as technologies change, they don't always benefit people equally.

Young and in debt

Consumer technologies are shaped by those who use them most and those who

have the highest disposable income. Teenagers don't always have the latter, but they are particularly vulnerable to fashion and advertising. Social commentator McKenzie Wark has described the mobile phone as the "street cruiser's" technology. He sees it as less suburban than the Internet, which is a technology based on staying home. As young people value frequent and intense interaction with friends, and socialising away from the home and the watchful eye of parents, it's not surprising that mobile phones appeal to them so much.

Mobile phones also appeal to young people as a means of self expression. They can be personalised with a multitude of different skins, and the ring can be programmed to play a favourite tune. Personalised ring tones have a practical purpose in that they differentiate your ring from others so you can tell when it's your phone ringing. However, like clothing, they also individualise you. More specifically, they identify you with the musical and social subcultures you favour. Personalising phones in this way is about conferring status as much as it is about utility.

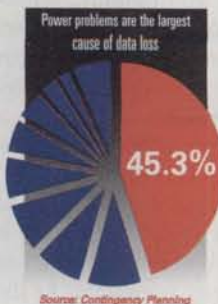
Another popular aspect of mobile phones among young people is SMS text messaging. When Optus offered its subscribers a free trial month last year, about 17 million messages were sent per week. The popularity of SMS took off markedly in April when Telstra, Cable & Wireless Optus and Vodafone agreed to an interconnected system allowing all users to send messages to each other. According to Finola Thompson of Cable & Wireless Optus, SMS appeals to people partly because it allows them to contact each other anytime, anywhere, without fear of making too much noise. Because of its capacity for discretion, there have even been concerns that SMS has been used for cheating in exams.

The abbreviated language SMS inspires is another appealing aspect of the technology for young people. Abbreviations such as BCNU (be seeing you) and PCM (please call me) reduce the number of key strokes necessary to send a message. Learning new shortened words, using them and making up your own can be a creative process. Critics have argued that email is altering written communication through its emphasis on brevity. If SMS becomes genuinely widespread, its effect could be even greater.

Mobile phones are rather like toys to young people, but their costliness is produc-

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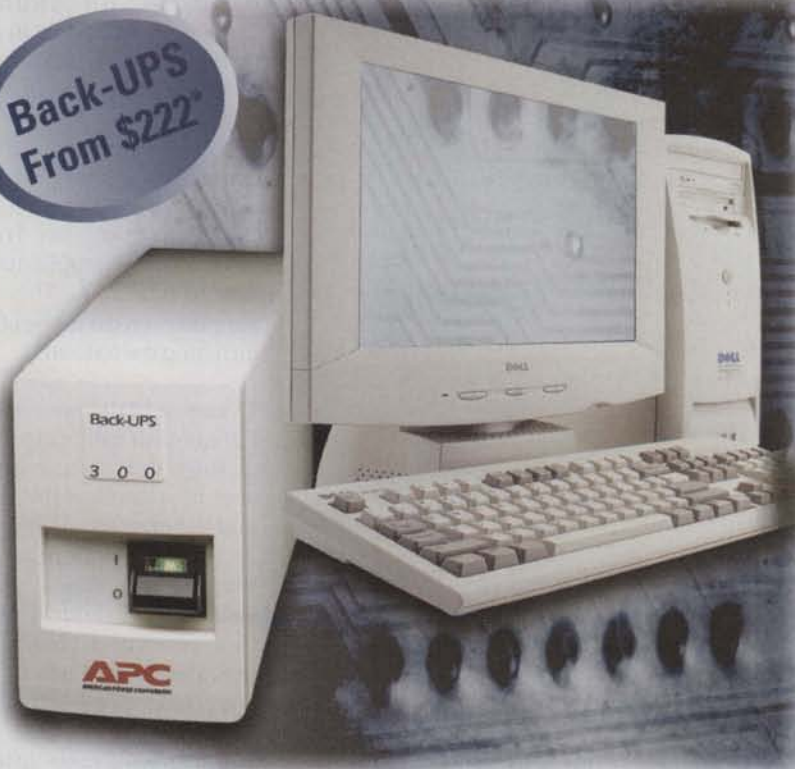


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ing very adult problems. Young people are highly represented among those trapped by mobile phone contracts they don't understand, and by bills they can't afford. *Mobile Matters*, the 1999 report on mobile phones and young people by the Communications Law Centre (CLC), found that a significant number of young people have problems with mobile phone costs. A survey the CLC conducted found that 18% of people aged between 14 and 17, and 36% of people between the ages of 16 and 24, own or have use of a mobile phone. Of this group, 18% had difficulty paying their bills, and 17% were anxious or depressed about the payment difficulties they were experiencing.

The report also found that 11% of respondents didn't read the contract they signed, and that 7% didn't understand it. The NSW Juvenile Justice Minister, Carmel Tebbutt, commented on the survey, criticising the complexity of mobile phone contracts, and accusing carriers of targetting their products at those who can't easily pay their bills. According to Tebbutt, carriers should provide one page, plain English summaries of phone contracts. These summaries should state the real cost of the contract, the duration of the contract, the penalties for termination, the actual call charges, the frequency of payments required and contact details for the organisation the consumer can contact if they're unhappy about the service or the terms of the contract.

Mobile phone companies have also been accused of using misleading sales practices and heavy-handed debt collection methods. In one widely publicised incident, a man fell behind in his payments while in hospital and was approached by debt collectors while still in his hospital bed.

This is probably an extreme example of misconduct, but it isn't an isolated one. The NSW Department of Fair Trading received 1,300 complaints in the year to June 2000. These complaints covered a range of issues including the following.

1. Sales staff did not reveal the full range of call prices.
2. Sales staff were untruthful about the length of the contract and the amount of 'free' calls.
3. Debt collection methods were heavy handed.
4. Sales staff claimed wrongly that customers could cancel their contracts at any time.
5. People were entrapped into paying others' bills by signing as 'referees'.
6. Cancellation of contracts attracted high fees.
7. Contracts allowed companies to vary charges.

In August, the Minister for Fair Trading John Watkins confirmed the seriousness of the situation by saying that "Young people are constantly bombarded with advertising urging them to spend up big, and a lot of kids think they have the money to keep up payments. We're now dealing with 15-year-olds with the difficulties that normally face adult consumers."

Matt Deighton, a lawyer with the Redfern Legal Centre, told the November CTN conference that the true cost of contracts is often hard to determine. In his view, "low startup costs make mobiles popular amongst those who can least afford them".

According to Deighton, although companies that market over the phone often claim that no contracts are required for their deals, in reality they do expect subscribers to sign a contract. This is usually one with minimal terms and conditions. Even when

this isn't required, an implied contract is enforceable under law. Misinformation like this is sometimes intentionally provided, but Deighton believes it is often due to an inadequate understanding of contracts on the part of sales staff.

Deighton warned that with increasing bundling of services such as mobile and Internet, contracts will become more and more complex. Consumers will find these contracts difficult to understand, and will be encouraged to purchase services they don't need. This complexity will be exacerbated by roaming agreements. Few carriers have national networks, and roaming agreements between networks allow mobile users to call from anywhere in Australia, and in some cases, overseas. However, these agreements complicate the question of liability. If consumers experience problems, it may be unclear who they should complain to.

He also warned that although phone number portability is convenient, it is likely to encourage bad practices such as spamming and carrier slamming. As the government is reaping vast profits from spectrum sales, its role in regulating the conduct of mobile phone companies is bound to come under the microscope.

In space

Despite the complexities of contracts, the popularity of mobile phones continues to grow. Mobile phones aren't only convenient, they have the capacity to redefine space. In this sense, mobile phones appeal to more than our needs and our desire to elevate our status. The mobile phone is also about escapism, which may explain why it is used so much on public transport.

According to McKenzie Wark, "Social space just isn't social any more, now that anyone can 'privatise' it with a cell phone". When people call friends or family from train carriages and buses, it's often clear from their conversations that urgent information isn't being conveyed. Instead, a portable and comforting bubble of privacy is being established. The extremely public space of public transport is transformed into a private, home-like space by connecting with family and friends.

At the same time, the mobile phone creates a disruption of social space by making too much noise. As early as 1988, critics grumbled about the noise associated with

"Low startup costs make mobile phones popular amongst those who can least afford them."

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mobile phones. Robert Haupt complained in the *Sydney Morning Herald* that rules need to be established for mobile phone use. He decried the common sight of "people yapping away shamelessly in full public view", almost as though he felt they were engaged in a shameful act. We've all overheard someone on a bus, train or park bench discussing their love life or their mother's drinking problem on a mobile phone. For many, the sense of discomfort produced by this mix of public and private is profound.

It's not only the content of mobile phone conversations that infuriates listeners. The noise is also a distraction. Phone ring tones and SMS beeps are all around us, and their familiarity isn't diminishing the annoyance. In July last year, Anne Summers mirrored Haupt's feelings when she complained that "It seems there is nowhere to go these days to escape the cacophony of trills and tunes that signal incoming calls... and the invariably mundane and unenlightened business of others". Like Haupt, Summers calls for careful thought on mobile phone etiquette.

According to University of Sydney academic Soames Job, noise is such a significant problem with mobile phones that mobile users should be separated into different carriages on trains. A researcher into the effects of noise on behaviour, Job has found that one-sided conversations are particularly annoying to listeners, but that ring tones are also difficult to ignore. In Britain and Europe several rail services already have mobile-free areas.

After hours

If mobile phones have the power to turn public space into private space, they can also do the opposite. As mobile phones become more common, their use as a standard work tool has also grown. In some industries, mobiles are almost obligatory. Kevin Sheehan, the president of the Real Estate Institute of Australia, told APC that mobile phones are "a great adjunct to communications in the real estate industry". Real estate agents spend so much time in the field that "the immediacy of mobile phones is invaluable," he said. "I paid \$4,000 for my first mobile phone in the late '80s and I haven't been without one since."

Mobiles can be very convenient for those in industries like real estate, but they also come at a cost. "I have to admit, the mobile phone has extended the 'at home' facility for agents," Sheehan said. "If a mobile number is included in promotional material, you can bet that it's the number clients will call. In a sense, the mobile number has become the after hours number." According to Sheehan, portable devices such as hand-

There's a danger that when people are given mobile phones for work, they will be obliged to keep them turned on.

helds and mobiles are extremely popular among estate agents, and they're becoming more and more central to their work. Sheehan feels that because mobile phones have the ability to connect people at any time in any place, rudeness is a by-product. "If you don't want to be reached, turn your phone off or don't answer it," he said.

As mobile phones are carried on the body, they have the ability to bring the workplace into the home. Other office equipment is left behind at the end of the day, but the mobile phone can keep people connected with their workplace around the clock. In this sense, the mobile phone has the power to transform the private space of the home into the public space of work. Whether this becomes an issue for workers remains to be seen.

Richard Harris, union organiser with the Media and Entertainment Arts Alliance, told APC that "it's not something that's come up as a problem yet, but it's probably developing". Mobile phones have only been an important part of the workplace for about four years, so at present "the union is in the process of formalising the 'getting' of mobile phones for workers. Once the novelty has worn off, people may not be so happy to have them," he said. According to Harris, there's a danger that if people are given mobiles they will be obliged to keep them turned on.

Gwan (not his real name), a systems administrator with a NSW government department, has had a work-provided

mobile phone for four years. "Mobile phones are ubiquitous in the IT industry," he said. "I know people in the industry who hate keeping a mobile phone for work. They feel it's an invasion of their privacy and an informal extension of their work time."

For him, the mobile means that he is freed from having to call in to check on the system because he knows others can contact him if need be. In the event of a problem, the system generates an SMS message that is sent to his mobile. "I don't mind taking my mobile home, because I like to know what's going on with the system, and I know that my colleagues won't abuse their power to contact me. I wouldn't be happy if they did," he said.

Gwan thinks that WAP phones will exacerbate the problem when data speeds improve, because they will allow more work-related material to be sent through the phone. As McKenzie Wark has put it, mobile phone technology "infiltrates spaces with data". The question is, how far do we want the infiltration to go?

There's no doubt that mobile phones are changing our lives. Battles over the role of mobile phones in work, and over maintaining the distinction between work and home are on the cards. The safety of mobile phones, and their role in the lives of the young, rural dwellers and the disabled will also remain in contention. With technology moving so quickly, these debates must happen in transit. Hard and fast answers are likely to elude us. ■



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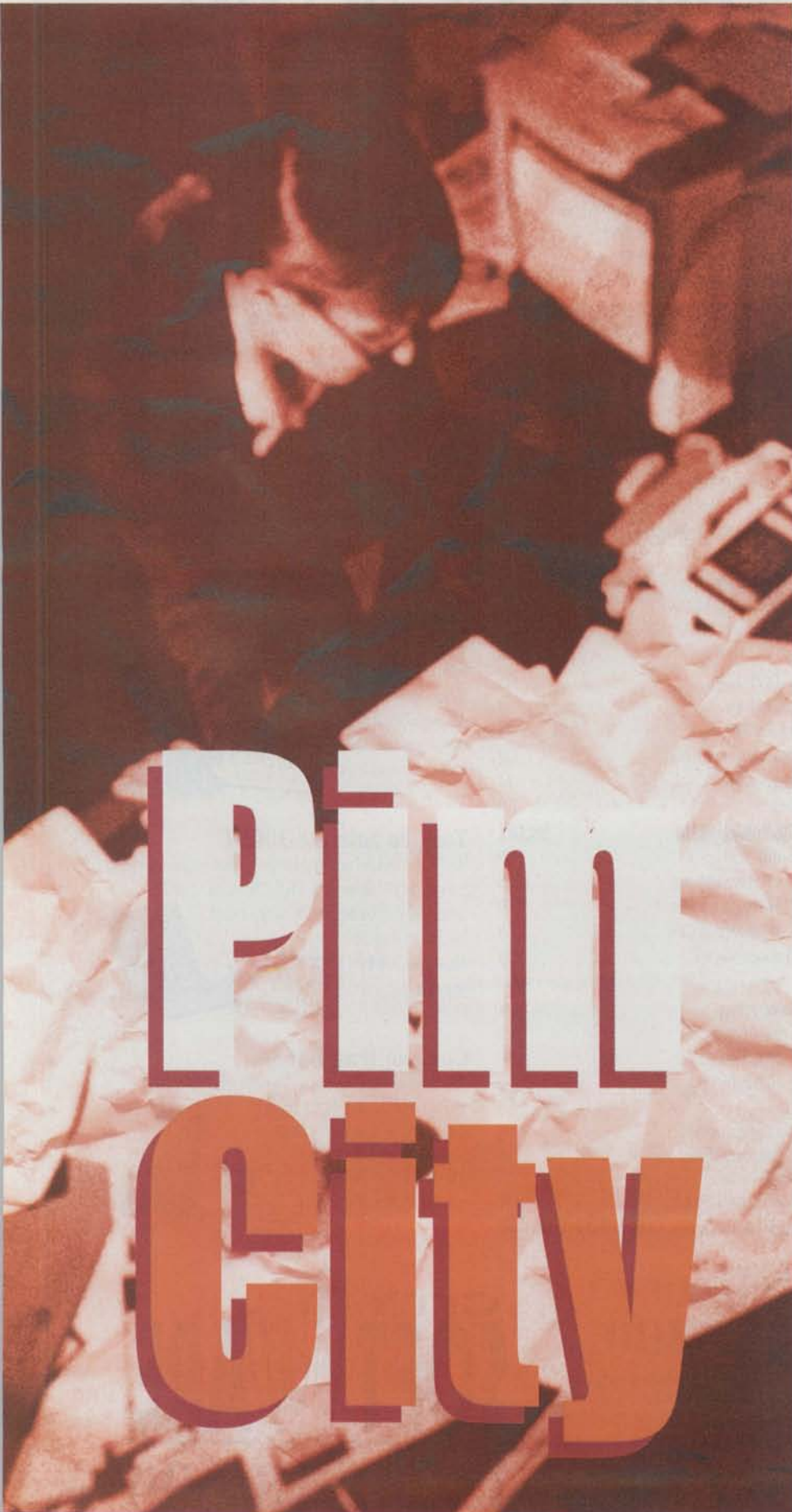


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Personal information managers (PIMs) make co-ordinating your work time and space easy. So if you find yourself swamped with memos and Post-it notes and hopelessly behind in your work, it might be time to get yourself a PIM.

*By **Daniel Gardiner***

If the information age has made one thing clear, it's that too much information can drive you around the bend. The solution? Find a way to collate and arrange all your data so that it's easily accessible and digestible. Personal information managers (PIMs) are useful tools for doing this. There is a large variety, but most share the same basic components: a contact list, a calendar, a task manager and a memo creator.

For most people, these four modules are more than enough. However, if your needs are more specialised, there are PIMs with sub-programs that can handle more complex tasks such as creating sales graphs or scheduling group assignments and meetings. It can be incredibly difficult to change to another PIM and take all your data with you, so carefully consider your needs before committing yourself to a specific program.

PIMs have been around for a long time, but it's only in the last few years that the Internet has begun to play a key role in them. Connectivity has added a new dimension, and new standards have arisen to make data sharing much easier. Formats such as vCard, vCalendar and iCalendar allow you to create contact or schedule information that can be transferred to other computers and imported into their PIMs. The importance of these formats means that Web connectivity is now a key component of a good PIM.

Interface is also very important. After all, what is the point of having extensive databases of information if it takes forever to access what you need? When judging programs, APC focused on three main areas: the interface and its ease of use; features and support for PIM standards; and Web connectivity. We've highlighted the benefits of each PIM for different users to make it easier for you to find the one that best suits your needs.

Above & Beyond 2000



Above & Beyond lacks style, but it attempts to make up for this with more functions. The standard view is rather unsightly and the multitude of buttons and toolbars can take a little getting

used to. The three main windows show you a schedule, a time graph and a calendar. Underneath its rather daunting exterior, the program's main focus is on project and time management. It comes in two modes, Lite and Pro, and you can switch back and forth between them. The Pro mode provides more specific scheduling options. It has a complex calendar system which allows you to schedule very specific time periods for tasks and there's also colour coding which shows you how busy you are on certain days.

The program still lacks Web integration. Email is supported only for fellow Above & Beyond users. This compromises the rest

of the program. Still, if you're after a sombre, no frills, time-management program, then Above & Beyond could be perfect for your needs.

Daniel Gardiner

Pros Great for time management
Cons Needs more Web support
A tad expensive

Contact 1Soft
Phone N/A
Online www.1soft.com
Price \$US149.95 (Pro version), \$US49.95 (Lite version)

ACT 2000



This well-rounded PIM is directed towards people in marketing and small business. It has all the usual features, such as a contact list, tasks and calendar, and these are generally of a high standard. Its email integration is also first-rate. It has

its own built-in email program that can plug into programs such as Microsoft Outlook, Eudora Pro, Lotus Notes and cc:Mail, and act as a standalone email client for ISP-based email. APC was particularly impressed with how easy it is to set up ACT 2000 for Lotus Notes. Within two minutes of starting the program, we were up and running. Many items in ACT 2000 are also customisable, from toolbars down to task templates.

The software also comes with SideACT, a small program that sits in the system tray and can be used to rapidly add tasks (to-do items, appointments or calls) without going into the main program.

When you look past the basic features, ACT 2000 is a very specialised pro-

gram. Focused on managing contacts and sales, it has specific databases for sales reports and opportunities, and it can generate graphs and sales funnels from these figures.

Daniel Gardiner

Pros Good features
Customisable
Cons Above average price due to its specialised nature

Contact Interact Commerce
Phone (02) 8879 1005
Online www.actsoftware.com
Price \$219 (single-user licence)

AMF Daily Planner & PIM



If your main purpose in buying a PIM is to take advantage of the calendar functions (appointments and the like), the AMF Daily Planner could be just what you're looking for. Conveniently, all views in the small program window have

an embedded calendar.

AMF Daily Planner doesn't have as many features as some of the other programs APC examined, but it is full of neat and useful touches. For example, just about every conceivable detail (including spouse names) is included in the contacts book. Embedded in the interface are quick launch buttons for common Windows applications such as Task Manager and Windows Explorer. Oddly enough, AMF Daily Planner launches its own calculator application, which is inferior to the standard Windows application. It even launches defined Web browsers.

The only other aspect of the Daily Planner that didn't impress APC was the fixed size of the screen image. This could

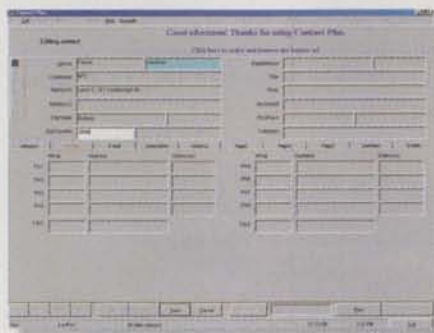
be a problem for people with poor eyesight, or for those who have monitors unable to handle larger resolutions. If these considerations don't concern you, AMF Daily Planner and PIM is a very sensible choice.

Alex Kidman

Pros Good calendar and contact features
Cons Screen image size not adjustable
Inferior calculator

Contact AMF
Phone N/A
Online www.amfsoftware.com
Price \$US29.95

Contact Plus Personal Edition



The last time APC looked at PIMs (APC January, page 93), we praised Contact Plus for its highly customisable user interface, yet had to scold it for being ugly. If you loaded any flat form database that was meant to

work under DOS 5.0, chances are you'd find it was prettier than Contact Plus.

Not a lot has changed. Based on the version APC downloaded, it seems that only one thing is different: Contact Plus is now available for purchase or free with an advertising banner that constantly extolls (you guessed it) the benefits of owning Contact Plus.

Customisation is still one of the best features of Contact Plus. Almost any field can be renamed, but the word length allowed is a little shorter than would be ideal — if you want categories longer than 12 letters, you need to abbreviate.

If you can stand the ads and the interface, and you have the time and patience

to customise it to your liking, Contact Plus Personal Edition is a reasonably powerful PIM that only barely lags behind the more powerful (and more costly) alternatives.

Alex Kidman

Pros Highly customisable
Two versions (one free)
Cons Ugly interface

Contact Contact Plus
Phone N/A
Online www.contactplus.com
Price \$US49.95

CorelCENTRAL 9



CorelCENTRAL 9 comes as a component of WordPerfect Office 2000. It's normally visible as a sidebar (called the Day Planner) that is automatically hidden when not in use to free space on your desktop. Its standard features are minimal — there's only

a basic address book, a calendar (with built-in tasks) and memos. These all work reasonably well, and like some of the other PIMs in this feature you can drag-and-drop between some components, such as the address book and the calendar.

The main features of this PIM are only average (for example, it lacks native support for vCard and vCalendar), but this shortcoming is offset by the Card File feature, which works as a highly customisable database. You can create your own fields or choose from a range of pre-existing ones to store your information, and these can then be filtered for search purposes. CorelCENTRAL also has HotSync support, so if you use a PalmPilot you can share events, contacts, tasks and memos between the two. On the

downside, the program suffers from poor Web integration, and it can be quite difficult to set up email support for the address book.

This is a mediocre PIM that is designed to work with WordPerfect, and therefore integrates poorly with anything else.

Daniel Gardiner

Pros Good use of databases
Cons Core features are lightweight

Contact Corel
Phone 1800 658 850
Online 202.139.115.2
Price WordPerfect Office 2000 costs \$825.95

Day-Timer Organizer 2000



Day-Timer Organizer 2000 was reviewed in APC's last PIM roundup, and it has stood the test of time well. The standard calendar view presents you with a diary-like interface that is quite intuitive and easy to learn. Its Web integration isn't as comprehensive as more up-to-date PIMs,

but it offers support for MAPI and VIM-enabled email clients, so you can email directly from Organizer's address book.

You can also import from vCard and vCalendar. The inclusion of drag-and-drop functions means you can create appointments by grabbing an entry from your address book and placing it onto your calendar.

What makes Day-Timer's program really stand out are its extras. It comes with components that are particularly helpful if you are running a small business. For example, TeamOrganizer helps you to organise large meetings or events involving individuals, groups and resources.

There is also a subprogram called ExpressServices that sits in the system tray and provides instant access to Organizer's com-

ponents, such as contacts and calendar, even when the main program isn't running.

All these features mean Day-Timer Organizer 2000 has aged gracefully. It was released two years ago, but it's still an excellent choice.

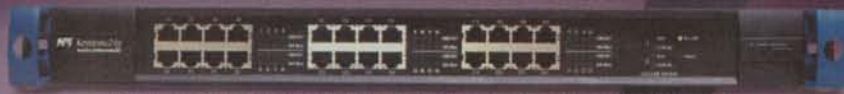
Daniel Gardiner

Pros Good interface
Many useful extras
Cons Some features need updating

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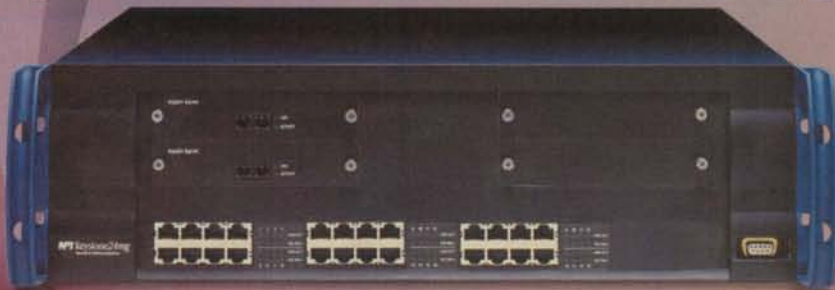


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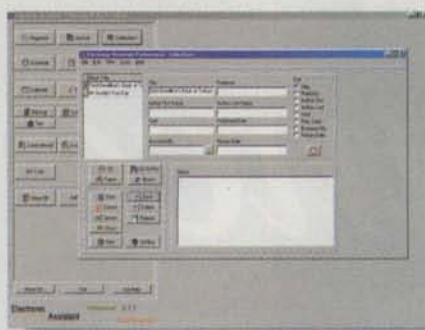
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Electronic Assistant



It's hard to fault Electronic Assistant Pro. Along with the usual calendar, appointments and contacts functions, it can also handle email and FTP applications and can manage collections of books and CDs.

This rather unusual range of extras is useful if you want to organise information that isn't usually associated with PIMs.

However, the program could use some improvement of its interface. Everything is controlled through a dull button panel and a lot of common functions, such as saving, are on the left-hand side most of the time. The onscreen options tend to move around, which makes Electronic Assistant harder to use than it should be. There's also little indication of whether or not you are editing records or simply viewing them, which can be a source of some frustration.

Electronic Assistant is also available in a Pro version. It has additional capa-

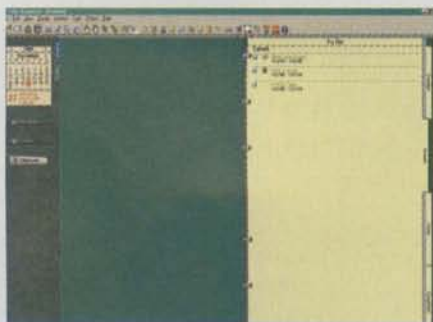
bilities (such as the FTP client and some user definable modules) and costs \$US19.95. However, if you only need the basic features, the Lite version is available free.

Alex Kidman

Pros Good FTP and email support
Cons Poor interface

Contact Dante Productions
Phone N/A
Online www.danteproductions.com
Price Pro \$US19.95, Lite free

Lotus Organizer 6.0



Lotus Organizer 6.0 has many features and an intuitive diary/organiser interface. Different pages of the diary represent different components. It has all the standard components plus sections for Web page links and a call scheduler/recorder to keep track of

phone conferences. It can convert data from a number of other PIMs such as Microsoft Outlook 98, Day-Timer Organizer 98 and ACT 3.x (most of these are at least two years old, which isn't much good if you have later versions). It also has vCard, vCalendar and iCalendar support, along with EasySync for PDA synchronisation.

It contains a daily planner for managing time allotments and scheduling tasks, which works well but is rather basic compared with those in other PIMs. You can link just about any task, contact, event or memo with any other, which means you can cross-reference everything in the program — a particularly useful bonus.

There are some rather unusual inclusions that exceed standard PIM functions,

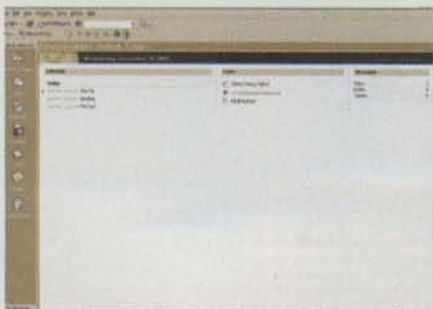
such as the ability to look at specific street maps or get driving directions from MapQuest.com. Lotus Organizer is a great package, especially considering that it is comparatively inexpensive.

Daniel Gardiner

Pros Good all round package
Reasonably priced
Cons Rather basic daily planner

Contact Lotus
Phone 1800 252 408
Online www.lotus.com.au
Price \$108.50

Microsoft Outlook 2000



Outlook is available as a standalone product, but it's really a component of Office 2000. It ties in well with the other Office programs; actually, it's almost essential to them. The interface is a change from the standard PIM. The Outlook Today screen summarises the calendar items and tasks

on your agenda, as well as changes to your email folders. This is the best aspect of the program, because it allows you to see all your activities on one screen, making it easier to coordinate your workload.

Outlook has the usual contacts, tasks, mail and calendar features, as well as sticky notes. There's also support for vCard and vCalendar. The remote mail feature allows you to synchronise with your work email from other locations, such as a home PC or a laptop. However, this requires dialup support from your office intranet. A built-in (but scaled-down) version of Internet Explorer allows you to surf from within Outlook. A minor failing of the program is its lack of built-in support for Hotmail and newsgroups, both of which are useful features of Outlook Express, the

default Windows mail program.

Outlook 2000 is a fairly comprehensive PIM with a better than average user interface. It handles the basics well, but as a standalone product it's a little too pricey to be a worthwhile purchase.

Daniel Gardiner

Pros Great user interface
Cons Lacks some of the best features of Outlook Express

Contact Microsoft
Phone 13 20 58
Online www.microsoft.com
Price \$215 standalone, or purchased with Office 2000 Standard Edition \$895

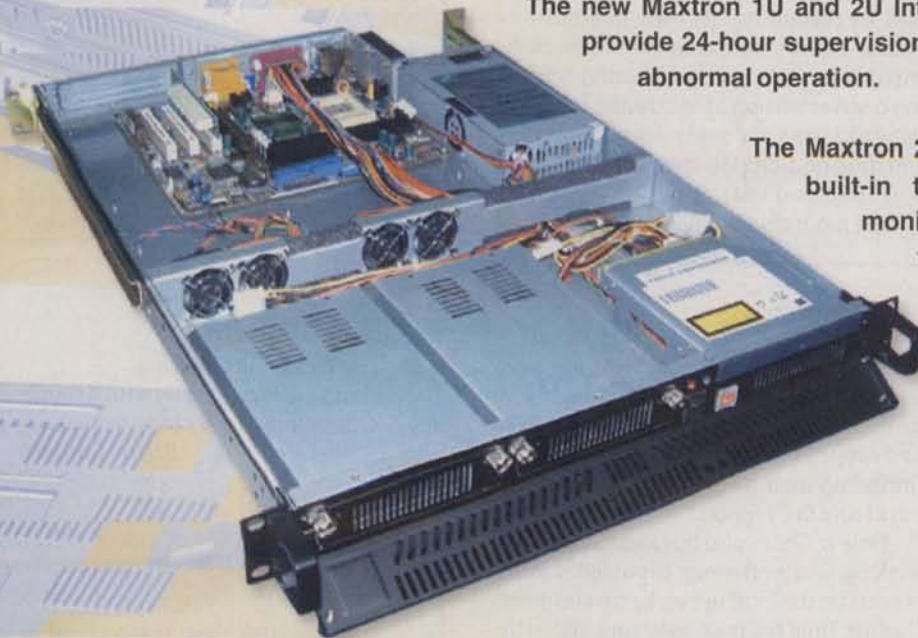
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Multiactive Maximizer 6.0



This is another high-quality PIM with a great range of basic functions as well as a lot of extra modules. Maximizer is primarily targeted at salespeople, but some aspects are useful for everyone. You can install spe-

cific components for different needs, such as sales, financial, high tech and SOHO.

It also contains a reasonably comprehensive built-in email client, with support for most of the main MAPI and VIM-compliant mail programs (such as Notes, Exchange, cc:Mail and Eudora Pro). It integrates quite well with word processors such as Microsoft Word or Lotus WordPerfect, as well as containing its own internal program. There are extensive networking capabilities for database sharing, including a server version of Maximizer for larger networks. As with many larger PIMs, you can drag-and-drop to create appointments and associated tasks.

The main disadvantage Maximizer has

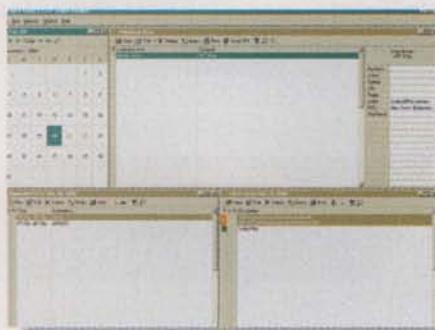
is that it is designed with businesses rather than individuals in mind, and consequently it is more expensive than most of the other PIMs featured here.

Daniel Gardiner

Pros Great extra features
Built-in email client
Cons Pricey

Contact Multiactive
Phone (02) 9810 9300
Online www.multiactive.com.au
Price \$360

Time & Chaos 5.3.8



This fairly straightforward PIM contains a tasks list, appointments, calendar and address book. It is very easy to use and its clean interface makes it good for beginners. It does away with the extras that other PIMs such as ACT and Day-Timer Organizer pro-

vide, but it performs its four basic functions very well. Contacts can be cross-linked with tasks and appointments by a simple drag-and-drop. There is basic Web integration (including mail merges), along with MAPI email and fax support.

Time & Chaos also has some simple networking and workgroup capabilities. A list of users on the local network provides access to other Time & Chaos users and allows the sharing of PIM-related data. There's support for vCard, but not for vCalendar. There are also a number of extras geared towards specific needs which can be purchased separately from the main program. For example, HotSync support is available for \$US24.95. Other plug-ins include database synchronisation for laptops or other secondary PCs,

and expense and sales tracking.

This is a well-rounded PIM with a simple interface that makes it a pleasure to use.

Daniel Gardiner

Pros Easy to use
Good basic elements
Cons No vCalendar support
Purchasing additional modules could become expensive

Contact iSBISTER
Phone N/A
Online www.isbister.com
Price \$US45

Ultra Hal Assistant



This is a unique program from Zabaware that has some of the features of a PIM (its Web site boasts that it can act as "your digital secretary and companion"), but operates through a front end powered by a chat bot. This means that you can use conversational language to type commands which

the bot then adds to its database. You can also speak commands using the speech recognition software that comes with the registered version. This is a great idea, but the PIM side of the program is very amateurish, and getting information out of it is annoying. You often need to rephrase your questions to get the correct response.

Daniel Gardiner

Pros Entertaining chat bot
Cons PIM elements amateurish

Contact Zabaware
Phone N/A
Online www.zabaware.com
Price \$US34.95



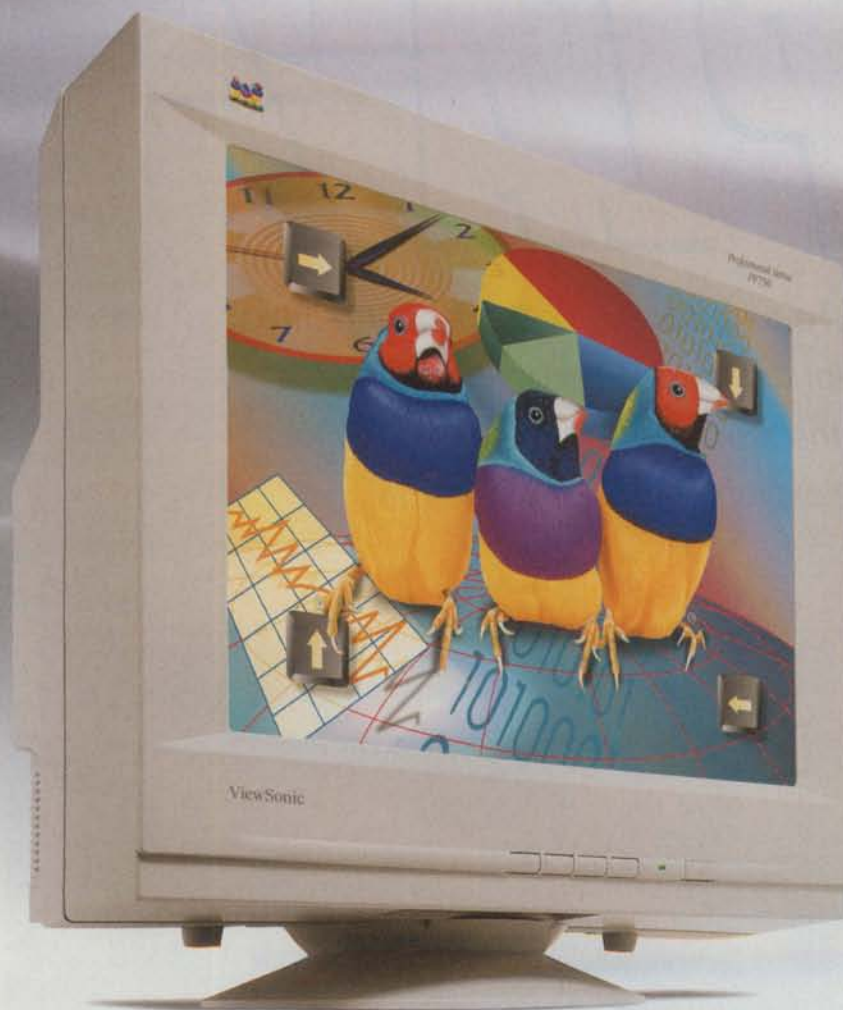
Lotus Organizer 6.0

Highly commended
Multiactive Maximizer 6.0

Most of the programs in this PIMs roundup performed well in their chosen areas of specialisation. Lotus Organizer picked up the Editor's Choice because it is easy to use and inexpensive. For businesses after more specialised software, Maximizer is the best choice as it provides enough useful extras to suit almost anyone.

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SCREEN PLAY



Whether you're a budding professional film-maker or you just want to produce better-than-average home movies, the humble PC can handle the job.

Philip Moore explains how.

We've all seen the TV ads with actor Jeff Goldblum insisting that it's easy to make your own movies on an iMac computer. For once, the hype isn't too far from the truth.

The iMac DV is designed for the average home consumer, but even professional movie makers can do just about everything they need to on a basic PC without the expense of buying a high-end system.

The computer

If you're a video enthusiast, you will want a fast Pentium III with at least 128M of RAM for the best results. A dual processor system can also be helpful. Windows 98, Me and 2000 are all suitable operating systems to work with.

A big SCSI hard drive is good for holding large video files, however, some of the more recent ATA/IDE models offer very impressive speeds and huge capacities. You'll need at least 40G to work with. A big monitor, or even dual monitors, can also be a great help. Throw in a decent 16-bit soundcard and a 3D graphics card and you're almost there.

The camera

There are two kinds of video you can work with — analog and digital. Analog video is anything that's on VHS or Super VHS tape, Video8, Hi8, or Betacam. To capture footage from one of these tape formats you need an analog capture card, such as the DC-30 Plus from Pinnacle. This card compresses the video as it captures it using Motion-JPEG. Some other cards use a form of MPEG compression. Within the limits of your system you can control how much compression is applied. This is where an Ultra Wide SCSI or Ultra DMA/100 hard drive and interface is really useful. Avoid cheap cards — you need something that can handle full-frame, full-size, PAL quality images (728 by 576 by 25 frames per second).

An analog capture card generally offers composite input/output for VHS and Video8, and S-Video input/output for the better quality Super VHS and Hi8. To capture footage effectively from professional Betacam, you need a capture card that offers component video, which splits the video signal into three parts.

Digital video has two main standards: the consumer Mini DV and the professional DVCAM. The basic difference between the two, aside from the cost and quality of the cameras, is that DVCAM runs the tape faster and has better resolution. The tape format and the compression are virtually identical for both, so even a

good Mini DV camera can produce better quality results than Hi8. Just be sure to get a three-CCD model.

The major producers of professional digital video cameras are Sony and Panasonic, and they offer a wide range of cameras. Sony's mid-range DRS-PD150P is particularly good. It has three CCD chips with support for Mini DV and Sony's DVCAM format, an LCD, professional quality controls and built-in effects, and is still small enough to operate with one hand. It is an ideal size and quality for any purpose that doesn't require absolutely optimum picture quality.

The card

All digital video cameras have a composite and S-Video connector so you can connect them to a TV. More importantly they have a FireWire socket (also called i.LINK, it's the IEEE 1394 standard). With a FireWire capture card in your PC, you can capture digital video from the camera to the hard drive with no loss of quality. The video is already compressed in the camera. The Studio DV kit from Pinnacle, and the Swann VideoWorks Software Toolkit are good basic FireWire cards.

FireWire cards are high speed interface cards. For best compatibility, the card should be OHCI (Open Host Controller Interface) compliant. FireWire is not just for digital video cameras. It is also a superior interface for many components such as external hard drives, CD drives and scanners. However, motherboard manufacturers do not typically include FireWire cards as standard, as they do with USB.

The more expensive FireWire cards also offer analog video outputs and better software. Even if you plan to work in digital video only, a composite out on the back of the card is very useful for pre-viewing on a TV monitor while you edit, and outputting to VHS tape. If you don't have analog output on the card, you can patch it through your digital video camera to get the same effect.

If you are using digital video then you don't need an analog capture card, but if you want both analog and digital capabilities, you should consider a card that offers both, such as the DVStorm from Canopus. The advantage of this is that you can convert your analog footage into digital video format as you capture, then work exclusively in digital video on your PC.

Some of the more expensive digital video capture cards, such as the Matrox RT2000 and DVStorm, have real time capabilities. This means they have plug-in



▲ Figure 1: Vegas Video has the best audio editing and mixing capabilities.

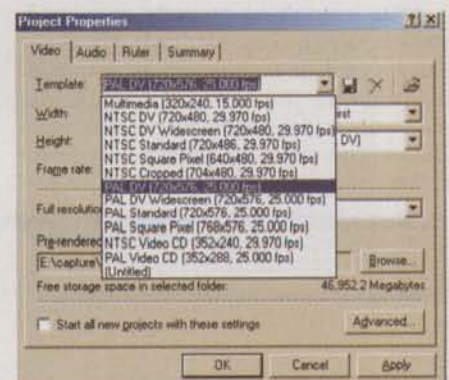
transitions and filters for Adobe Premiere that don't require prerendering. This can be helpful, but essentially, these are just software plug-ins. They don't necessarily offer hardware support for the real time capabilities, so you need to judge whether they are worth the extra expense.

The software

Now you have your PC, your camera and your capture card, all you need is the right software. Forget Windows Me's Movie Maker. For even half-serious video editing, you'll need to buy a video editing package.

The best PC video software is Adobe Premiere. However, Premiere isn't the only choice for serious enthusiasts or professionals. Ulead's Media Studio Pro 6 is a fine piece of software, and much cheaper than Premiere. Speed Razor from in-sync is marginally better than Media Studio, and Vegas Video from Sonic Foundry is great for audio-focused projects such as music videos. However, it isn't as impressive in the video area. Adobe Premiere has an advantage over its competition as many capture cards offer special driver and plug-in support for it.

This guide is based on Premiere 5.1, but similar principles apply to Premiere 6 (which should be out by the time you read this) and most other video editing packages.



▲ Figure 2: Vegas Video offers all the standard video formats.

Capture your clips

The first step in creating video is to capture the clips you want to use to your hard drive. It is good practice to capture only what you need. Any shots you know you don't want should be dumped to save hard disk space. Media Studio Pro and Vegas Video come with separate capture utilities, or your capture card may provide its own. Premiere has a capture utility built into its main program.

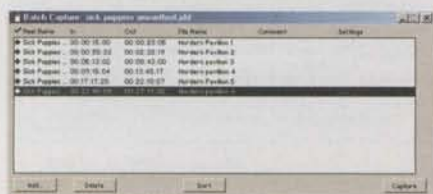
It doesn't matter what program you use to capture clips because any video software on your system will be able to read and work with the files, whether they are analog or digital, and regardless of their resolution or frame rate. However, it is best to capture all the files for one project in the same format, resolution and frame rate. Some programs can handle different types of files within one project, but this is more complicated.

For full PAL compliance (the Australian TV standard) your files should be 768 by 576 pixels by 25 frames per second, with square pixels. If you're using analog this can be cropped to as little as 720 by 520 pixels as the outside edges are not seen on most TVs. Digital video uses a standard frame size of 720 by 576. If you are working for broadcast or TV output, use these specifications.

If your project is intended for multimedia or the Web, you can afford to capture at a lower resolution and frame rate, which will save disk space. However, if you need to make a VHS copy and a version for the Web, work to the higher standard and reduce it at the end for the Web version.

If you are working in Windows, these files will all be AVI format. Mac users will use QuickTime. Your capture software should offer some templates to choose from to make this easier. Always work in PAL, unless your work is to be played in the US, in which case you should use NTSC.

With everything properly connected, you can capture clips by playing from the camera and clicking record on your capture software. If you do a lot of this you may want to use Premiere's batch capture feature. This requires a camera with device control and timecode capabilities, so you



▲ Figure 3: Premiere's batch capture feature can save a lot of time.



▲ Figure 4: Premiere's timeline window, with a transition between shots and a text title overlay.

can view and control the camera tape comfortably from within Premiere, and log the in and out points of the shots you want. When all shots are logged, press a button and Premiere will start capturing each shot to the hard drive as a separate file.

Originally the Windows AVI format only supported file sizes up to 2G. This quickly became a problem for digital video on the PC, as very big files are produced. Windows 98, Me and 2000 support the newer AVI 2 specification, which allows unlimited file size. Vegas Video 2 and the new Premiere 6 also support AVI 2.

The timeline

All video software uses a timeline display, which works in much the same way across all packages. Some video software, such as budget consumer programs and higher-end professional systems, also offers a storyboard view. For some reason, mid-range tools don't provide this feature, although it is now included in Premiere 6.

Once you grasp the principles behind video software it is very simple to use. You just load your captured clips into a media library or 'bin' (in Premiere parlance), and drag and drop these onto the timeline in the order you want. You can cut the clips into chunks and move them around, trim the edges of the shot with frame accuracy using a trim window, and play back directly from the timeline to see the result on a preview window or an external TV monitor.

You can use numerous video and audio tracks (usually up to 100) which are stacked on top of each other. The first video track comes as an A and B roll. This system comes from tape editing suites which have two tape machines (A and B) so you can bounce between them to create cross-fades and other effects. Between these A and B tracks is a transition track. Video software offers a vast range of transitions to choose from: simple cross-fades or dissolves, page curls, various wipes, iris, blends, chequerboard and a host of other bizarre visual treats. These can be fun in some contexts, but in

most cases straight cuts or cross-dissolves are appropriate. Even for something like a music video, most of these effects are just too tacky, so use with discretion.

Simple jobs can be completed using the A and B roll tracks. If all you want are straight cuts, just use one track, and butt the clips up against each other.

Overlays and filters

You can play your timeline back by pressing the spacebar. Any video software worth its salt allows you to preview your project in real time by playing the raw clips directly off the hard drive.

This changes once you start modifying the clips from their original captured state by adding overlays, filters, transitions and so on. Then you need to prerender those sections to temporary files.

Overlays are clips placed in track 2 or above. These have a transparency control and can be videoclips or special text clips. This transparency control allows you to superimpose images, fade clips in and out, or apply alpha transparency effects.

Figure 4 shows a black overlay in track 2 which is actually a text object with an alpha transparency. A fade in and out has been applied using the rubber band control visible in the pink box beneath the text clip.

Overlay tracks are also useful for storing clips. If you 'mute' the track then the clips do not play as part of the project, but can be seen and accessed easily. This is good for when you are working on a complex sequence like that shown in figure 5, and you are experimenting with moving shots around.

Figure 4 shows how you can create a quick cut effect by layering shots onto Track 1A and above (with no transparency setting). The gaps between the shots reveal the clips in any tracks running beneath. By zooming in you can finetune the start and end of a clip. Just grab its ends and drag them to where you want. You control where it starts in the timeline, and can also select the first frame and the duration of the clip.



▲ Figure 5: Trim clips and layer them to create a quick cut sequence.

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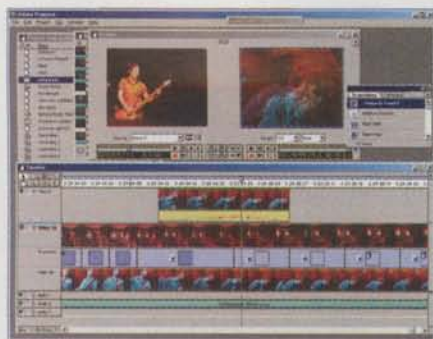
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The transition we have used here has been applied several times using slightly different settings each time. Most transitions allow you to alter how they run over time; this one does not. Repeated application with different settings is the way around this problem. There is also an overlay clip here with a video filter applied. Video filters are like the graphic plug-in effects in Photoshop, except they can also develop over time. This sequence uses a combination of displace and solarise. A frame from the middle of this can be seen in the preview window at the top right. This is one way of creating an original effect.

The standard range of transitions and filters provided in Premiere and programs like it offer some measure of control over how they are applied. However, if you want to create something really different you need to experiment. For some original filter effects you could try the Convolute Kernel in Premiere. This is a raw filter that allows you to enter your own settings to create a new effect.



▲ Figure 6: Applying a video filter to a clip.

Motion control

Another feature in most video software is motion control. This allows you to fly or slide clips in and out. It can also be used to create picture-in-picture effects by resizing one clip over another, and setting the same start and end positions so there is no movement. With 3D effects like cube and sphere, Media Studio offers more in this area than Premiere 5.1.

It's important to experiment. See what they can do, then try to take them further. Combine them with other effects, such as filters and transitions, to create new composite effects of your own.

You need to prerender any section you've applied effects to before you can play it back properly, but you can get an idea of how it will come out by scrubbing the cursor across the timeline (in Premiere press Alt as you scrub). The video will display in the monitor window, but not on your TV if you have it connected.

Titles and captions

Titles are placed in Premiere using the File/New/Title menu option. Premiere stores them as separate files, and offers control over font, size, colour, transparency and scrolling effects. However, other programs, such as Media Studio Pro, do this better. The Title Clip module of this program is more logical and much easier to use. It comes with a separate program, CG Infinity, for creating 3D text and object animations.

Getting the text to appear and move where you want on the screen can be a challenge. Often you have to add blank space around your text to get it into the

position you want. You can't simply treat text as an object and drag it into place with pixel-perfect accuracy.

For anything more ambitious than simple captions and scrolling text titles you need to use a dedicated animation program. Files must be imported in AVI format, and added to an overlay track. Adobe makes After Effects, which is a video compositing software tool that can do much of this for you.

Audio tips

Despite its advantages Premiere 5.1 does not have decent sound support. Every video-clip has its own soundtracks (unless you captured it with no sound), and you can add extra sound files to a project in WAV format for voice-over, background music and the like. Minimise these tracks whenever possible. Premiere really slows down when it's drawing a waveform display.

Another serious oversight in many video applications is that there's no easy way to record a voice-over synchronised with the vision. This is true for both Premiere and Media Studio. However, Vegas Video does this very nicely — after all, audio is its specialty. One alternative is to use a MIDI/audio sequencer program like Cakewalk, which can load an AVI file for the purpose of composing music to video. It's also ideal for recording a voice-over or lip-syncing as you watch the video playback in a window.

Another trick worth trying is creating an audio transition. This is where the sound from the next shot or scene starts playing over the end of the previous shot. To do this, you need to separate the video

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Newcastle, Nowra, Pakenham, Penrith, Richmond, Sale,
Shepparton, Toowoomba, Townsville, Traralgon, Wangaratta,
Warrnambool, Windsor, Wisemans Ferry, Wollongong, Yarram.



▲ Figure 7: This is the title generator in Ulead's Media Studio Pro.

and audio tracks of a clip so you can adjust the durations separately. In Premiere this is done with the menu command Edit/Break Link. You can then grab the start of the audio track and pull it over without the video track following it. Be careful not to slip the two parts out of sync.

Vegas Video handles this process better. It allows you to pull the audio duration separately to the video without losing link or sync between them.

Audio filters

All video software has audio filters for functions such as normalise, equalisation, reverb and echo. Media Studio offers much better and easier to use audio control than Premiere 5.1, and has support for DirectX audio plug-ins. Vegas is the best of all, with real time DirectX effects from one of the leaders in the field — Sonic Foundry. However, the new version of Premiere also offers improved mixer capabilities and DirectX audio plug-in support.

Your video editing toolkit

Hardware

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For those who take their audio seriously, it's always good to have a WAV editing program to finetune or clean up the soundtrack to an AVI file. Best for this kind of work is Sonic Foundry's Sound Forge, which loads an AVI file and allows

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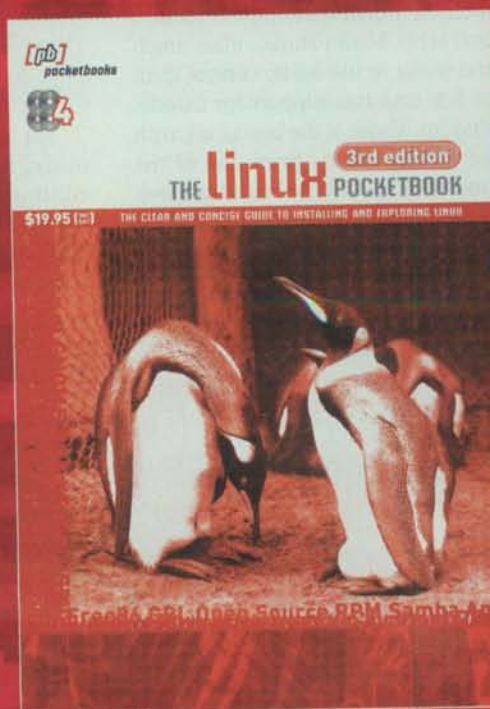
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Life as a free agent

One of the most persistent problems faced by corporate IT managers is finding decent staff. This year it is estimated that 4.5 million positions around the world will remain unfilled because appropriately skilled people aren't available. It's no wonder, then, that an increasing number of IT workers are demonstrating a preference for contract positions.

These mightn't offer the same stability as permanent roles, but the increased rate of pay and flexibility they offer more than make up for it. Outsourcing may now be a dirty word in government circles, but few large businesses can escape using contractors to cover at least some of their IT requirements.

Recent studies suggest that this situation is not going to change any time soon. Research firm The Meta Group estimates that by 2004, 50% of the IT workforce will be 'externalised', that is, working either in a contracted role or as part of a system outsourced to a third party provider. Most IT managers recognise the

technical challenges that this poses: the need for rigorous documentation, improved security, and a clear plan for how IT systems



are supposed to integrate into a business. However, many fail to consider the need for systemic changes within an environment dominated by contractors.

Traditional hierarchical management structures often fracture when contracting becomes the norm because the normal 'chain of command' is challenged. One of the most important ways to make such an arrangement effective is to maintain a well-staffed, active and organised human resources department. If you can't keep your contractors happy — paid on time at a fair market rate and given work of real value — they're unlikely to return. Well-designed IT systems play a role in keeping staff happy, but they won't help if you aren't also committed to creating a work culture that has room for employees of all kinds.

Meta's summary of the situation? "Through 2005, managing IT organisations will become increasingly complex, as command and control ceases to be a viable management technique, replaced by a high-performance, collaborative culture." If this doesn't sound like your business, then it might be time to start making changes.

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Linux inching onto corporate desktops

Linux isn't the first desktop environment to offer an alternative to Microsoft's Windows, but the efforts of a global group of developers to reproduce the Linux server's success on the desktop could make it the most popular.

By David Braue.

Over the past two years, Linux has developed from an elite toy into the mascot of the anti-Microsoft movement. Its greater reliability, faster performance and better security compared with Windows has made it a favourite on the server side, and many people who've tried it on their desktops swear they'll never go back to Windows.

It's widely recognised for its technical merits, but its introduction into the blood-thirsty commercial market has brought it into direct competition with Microsoft and a firmly established mindset that equates desktop PCs with Windows. This is a very real obstacle that has already thwarted contenders such as IBM's OS/2, Hewlett-Packard's ill-fated NewWave, and Quarterdeck's technically commendable DesqView.

Linux offers a completely new operating environment that delivers some very clear benefits, but despite this, Windows's stranglehold on the corporate desktop is tightening. Most people whinge loudly but put up

with it when Windows crashes, and Microsoft knows that few businesses have the guts — or the practical ability — to adopt alternatives. Even if influential Linux advocates push for new desktop strategies, they are likely to face considerable resistance from their peers, making wholesale change difficult. The table below, which was compiled by IDC, shows market share projections for the leading desktop environments, including Linux.

"Linux is definitely not a contender at the moment," IDC senior software analyst Natasha David said. "Windows is still the dominant operating system on the desktop, and that is not likely to change in the next few years. When we talk about end users, we're not talking about technology experts; we're talking about CIOs, executives and people doing jobs with the tools available to them. Microsoft has, and probably always will, corner the market, because people are comfortable with the user interface and the fact that most independent software

vendors develop software that's run predominantly on Windows."

Servers still hold the cards

A frontal attack on Microsoft would probably fail to challenge Windows's market domination, so it's something of a saving grace that Linux is being promoted through global grass-roots activism. By directing the collective ingenuity of the world's software experts into manageable projects, distribution authors such as Red Hat, Caldera, SuSE, MandrakeSoft and Debian offer a compelling alternative that costs virtually nothing and measures up well against Windows and existing versions of Unix.

Unlike previous desktop contenders, they're not duking it out with Windows 98 or 2000 to put bread on the table. Rather, they're concentrating on feeding a market that's hungry for robust Internet servers capable of providing reliable ebusiness capabilities. At this point, the availability of

Worldwide operating environment usage, 1998–2004 (000s)

	1998	1999	2000	2001	2002	2003	2004	1999–2004 CAGR*(%)
DOS	36,236	25,136	7,095	5,317	3,248	1,691	809	-49.7
Windows 3x/DOS	78,850	44,593	14,448	2,506	453	110	32	-76.5
Windows 95	123,075	121,272	77,554	65,044	34,154	15,715	4,970	-47.2
Windows 98 (including follow-on products)	12,784	53,582	103,518	148,659	173,547	187,857	194,390	29.4
Combined NT Workstation and Windows 2000 Professional	16,945	34,835	55,425	76,973	95,891	111,487	125,012	29.1
Mac OS	12,659	12,443	13,792	15,493	16,992	18,359	19,697	9.6
OS/2	9,072	3,829	1,840	525	289	142	62	-56.2
Linux	3,759	7,318	11,395	15,129	17,957	19,789	21,120	23.6
Other	10,921	2,673	2,343	2,027	1,524	1,045	650	-24.6
Unix, combined	3,386	2,031	1,792	1,547	1,335	1,174	1,033	-12.7
Total	307,689	307,712	289,203	333,219	345,392	357,367	367,774	3.6

Source: IDC

* CAGR stands for compounded annual growth rate

Linux desktops is merely an added extra for the Linux cause.

"From a commercial standpoint, Red Hat is not seeking to stake its fortune on the fact that there are trillions of desktop users," Red Hat Asia-Pacific vice-president and general manager Mark White said. "Obviously we want to be the choice, but there's an awful lot of legacy education around the Wintel platform. It comes down to a total cost of ownership challenge within corporates, but we're not really trying to fight that battle; we want to offer choice."

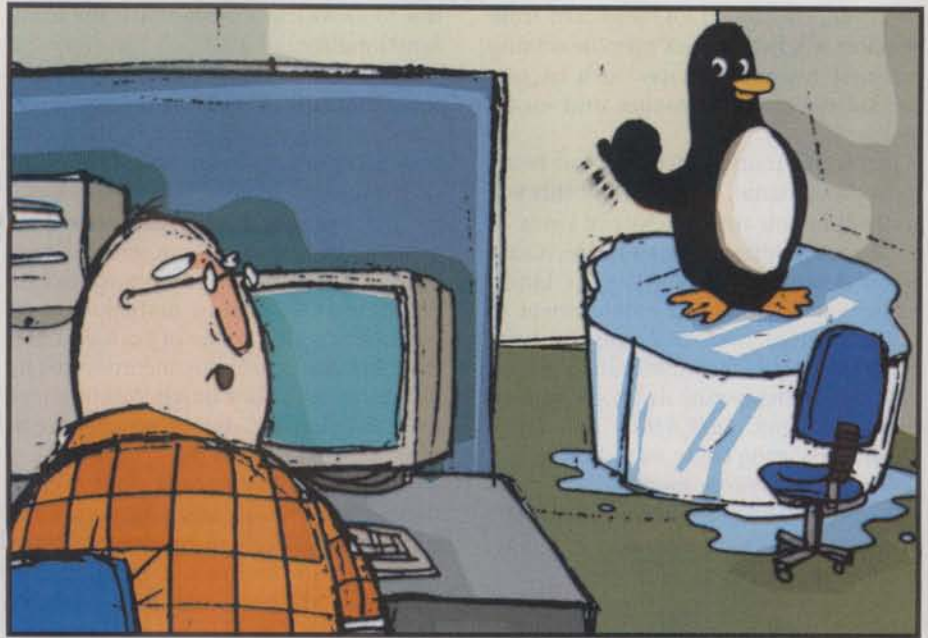
The chronic lack of applications that plagued Linux in its earlier incarnations made this pragmatism a strategic necessity. These days, much of this deficiency has been eliminated as Linux gains the support of big-name vendors offering very good desktop applications. Sun's free StarOffice has become the office suite of choice among Linux users, competing closely with Corel's strongly branded WordPerfect Suite.

Yet many key application categories continue to lag far behind their Windows counterparts, and the absence of a high volume commercial market could preclude long-term desktop application support from major vendors. IBM will spend over \$US1 billion this year to port its primarily server-side business applications to Linux, but companies involved in making desktop applications are far less optimistic.

Corel turned to Linux early last year as a potential saviour for its flagging applications business, but in December it agreed to sell its Linux products to investment firm Global Linux Partners (GLP) for a paltry \$US5 million and a 20% stake in a new spin-off.

Linux "is definitely a product that is in the mind-set all the time, but when you look at the revenue you need to keep operating, that's obviously where the majority of effort needs to go," said Australia-New Zealand country manager Gavin Watson. He was explaining why, despite its grandstanding for the Linux cause, the company omitted a Linux version from the new CorelDRAW 10 product.

Corel's increased involvement was seen by many as the potential mass-market shot in the arm that Linux needed. A great deal of work had been done to ease user training by making a Linux distribution as similar to Windows as possible. However, with its Linux investment now failing to break even, Corel is shifting its strategy. This year it plans to enter the highly crowded Linux server market. Corel's affiliation with whatever new company GLP sets up may mean the desktop version again becomes just another value add-on to accompany the server.



The corporate Linux desktop

Despite the commercial questions surrounding Linux, many small businesses consider it a big improvement on Windows. Country Petroleum, a Caltex petroleum distributor based in Dalby, north-west of Toowoomba in rural Queensland is one of these. After years using SCO Unix to run its Pick-based administrative system, the company's positive experiences with Unix made it more than willing to look at a Linux-based environment when it began considering options for a long overdue upgrade last year.

Working with integrator Opal Brook, Country Petroleum shifted to Linux and now relies on nine workstations running Caldera's OpenLinux distribution for most of its administrative tasks. It has moved the Pick database application (used to track fuel use and to bill customers) to an OpenLinux server, and implemented Sun's StarOffice 5 for general office productivity work. Two machines use VMware for Linux to provide seamless access to essential Windows and DOS applications in virtual Windows 98 boxes.

"We were looking for something better than Windows, and wanted to cut our communications costs between our outside depots," director Allan Campbell said. He reports performance increases of 10 to 100 times compared with the previous system. "The Unix box just sat there and ran, and the only times we had to shut it down was when we had a major power outage. Linux probably doesn't have the longevity of SCO, but it's not far behind it. While there has been a bit of a learning curve, the Pick system is about 20 times faster, and with VMware we can do everything we need to."

While Linux marketing tries to draw on experiences such as Campbell's to promote the adoption of Linux within larger enterprises, there is also considerable attention being paid to the technical side, with the latest round of enhancements culminating in the recent release of the long-awaited Linux kernel 2.4.

This new kernel version, widely expected to further bolster Linux's fortunes in the enterprise space, includes new server-side capabilities such as 32-way symmetric multiprocessing, support for large file systems and up to 64G of physical memory, plus Ext3 and ReiserFS journaling systems.

These capabilities should expose Linux to a whole new audience of previously reluctant enterprise customers, who will no doubt be tempted to experiment with the new Linux distributions on the desktop. Features such as improved USB, plug and play, and 3D graphics support will have a more immediate impact on desktop functionality. A steady improvement in graphical, intelligent and menu-driven installation has also made Linux more accessible.

These features mean Linux is running better than ever, on more systems than ever, but it will need the support of some very strong allies to clear the political hurdles that now lie in front of it. Just as AMD made Intel sweat when it convinced vendors that its Athlon processor offered better value than the Pentium III, Linux vendors are now starting to gain ground by securing similar partnerships. In the past year, major companies such as Dell and Compaq have started shipping desktop and handheld systems with Linux already installed.

These decisions should lend a lot of weight to arguments for corporate use

of Linux, as official endorsement from vendors will raise Linux's profile among business relevant services such as pre-loaded workstation images and onsite vendor support.

Enterprise management tools are being extended to Linux products and this will further promote the feasibility of Linux as a desktop solution. For example, Computer Associates' ARCserve for Linux extends remote backup management to Linux desktops, and last August the company convinced Linux distribution vendor SuSE AG to incorporate its Unicenter TNG Framework into SuSE Linux 7.0. Tivoli began supporting Linux workstations and servers in its network management products in 1999. This move has been copied by virtually every major network management vendor.

Not an either/or proposition

This commercial support can help eliminate management concerns among those companies looking for a way to integrate Linux desktops into an existing network infrastructure. At the same time, smaller businesses will take heart in the fact that — as is so often the case — kind souls have already developed

free tools which provide much the same functionality.

Red Hat's Kickstart utility allows desktop administrators to push out stock-standard Linux disk images across the network, the built-in LinuxConf application enables highly flexible remote maintenance, and SSH encryption provides for secure remote access. Caldera Systems, which has long targeted its OpenLinux eDesktop distribution at businesses with a range of back-end network interfaces, recently incorporated its directory and policy-based Volution tool for managing and deploying software to multiple Linux desktops.

Tight control over Linux desktop environments like KDE and Gnome allows corporate desktops to be tightly locked down, so inadvertent configuration changes — the bane of Windows administrators — can be avoided completely.

"Linux technology is Unix, and all Unixes have the inherent ability for remote management and support," Melbourne Internet consultancy Cybersource CEO Con Zymaris said. "Everything is designed from the ground up to be network-oriented and aware, rather than something glued on from the top, which is pretty much what's happened to Windows. Administra-

tors can avoid DLL hell by using a lot of these technologies that are built into Linux, and get very simple, locked-down, virus-free desktops that have no licensing fees associated with them."

Zymaris reports increasing usage of Linux as a desktop platform in thin client environments, particularly as its small footprint makes it a great way of extending the life of older systems. With all major thin-client systems (primarily Citrix Systems' MetaFrame and Tarantella's eponymous tool) already implemented in mature Linux products, thin client deployment may well prove to be the killer application for Linux in the corporate and SME space.

Like other versions of Unix, Linux also supports thin clients through its built-in X Window interface. Caldera's OpenLinux also comes in a version incorporating Tarantella. This provides a cheaper alternative to the Windows 2000 plus MetaFrame coupling.

These applications allow companies to resolve one of the biggest problems with Linux: the lack of Windows applications. Companies can install just one Windows 2000 server and use thin client Linux desktops to pull down Windows applications where necessary. Integration is now also possible using commercial tools like



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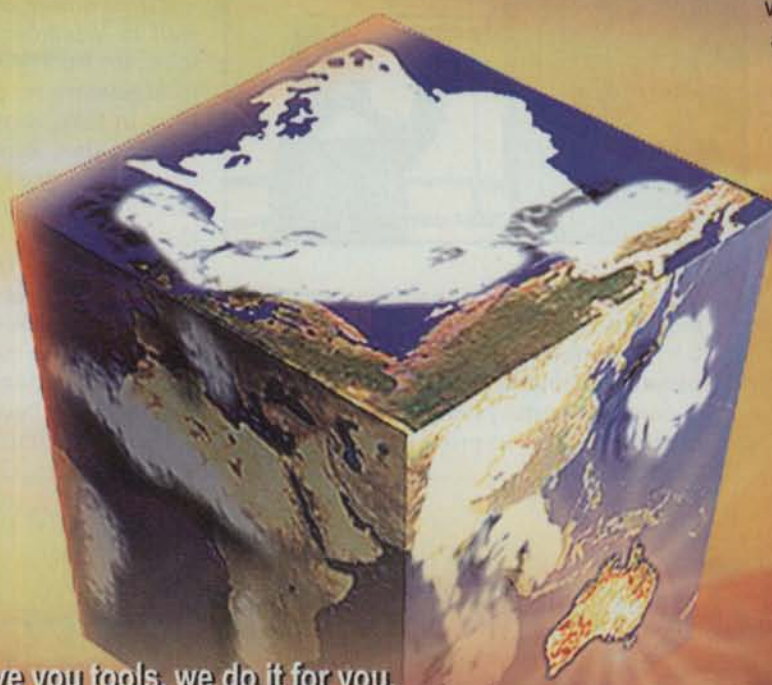
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VMware, which provides virtual Windows desktops within a Linux client, and NeTraverse's Win4Lin, which provides even more tightly integrated Windows application access.

The current 2.0 versions of such tools are quite effective and have been widely acclaimed, but licence costs can add a lot to the cost of a large-scale deployment, so costs for this configuration should be carefully compared with those for thin client server access and straight Windows installations.

"We think it's important, in a corporate environment, for Linux to fit into that environment so that people won't have to throw Windows out entirely," regional manager for Caldera Systems South-East Asia, Australia-New Zealand and India Gordon Hubbard said. "That's critical to us gaining a market in the corporate environment, but we've moved relatively slowly in the desktop market because there is so much inertia in the installed Windows base."

Tools alone aren't enough to create a world of converts. Far more important to the fate of Linux are the efforts being made by major enterprise hardware/software vendors to position Linux as just another platform, just another choice for

customers. In the US, companies like Dell, Compaq, Hewlett-Packard and IBM have led big computing's move towards Linux with a focus on preloaded Linux servers that is beginning to affect the desktop.

Will Linux match Windows when it gets there? On a feature-for-feature basis,



many advocates of Linux say the operating system is already there. However, Corel's turnaround indicates that the commercial market is still ambivalent about the operating system's potential to produce the kind of profit that the Win-

dows moneymaking machine has been generating for years. For now, Linux is likely to continue making its way onto corporate desktops through experimentation or personal choice.

"We run the whole business on Linux, but while most people ask whether we do that because it's free, the answer is no. We'd pay just as much for it, because the reliability speeds up the development process," Greg Davis said. He is a director at Brisbane Java development house Netstorm, where Linux has become the de facto development platform for building Java applications.

"If we'd been forced to develop the stuff in Windows, we wouldn't have taken the work," Davis said of a recent local government project. "Because we work in Java, anybody who makes a decision that forces you to use Windows, Linux or Mac forces you into a platform, and that is a bad decision for the software we're building. Sometimes we'll go into a project and haven't had control over the startup of that project, so 95% of the time we'll use Linux where we're more productive, then using VMware, change to Windows and run the process. Developing under Windows wastes too much of our time." ■

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Moving on

Once again, Workshop is on the move. You will notice a few changes rolling in over the following months. The end has come for the Core series, which has explored in-depth technology issues since March 2000. You can still find the complete collection on the apcmag.com Web site. This month also marks the final column in the Technobabble series. Nathan Taylor kicked off the series in April 1997 with an article explaining the inner workings of processors. Over the years, Technobabble has continued to unravel the basics of technology for APC readers. This month, in the final column, Alex Kidman looks at the workings of a computing device that is often taken for granted — the mouse.

There is a truckload of other practical information in Workshop this month. Step by Step assesses the need to defragment your hard drive, and the PDAs column provides essential tips on travelling with your Palm device and playing music on your Pocket PC or Windows CE PDA. If you are working on your Web building skills, you'll appreciate this month's Insite. It shows you

how to build a Visual Basic ActiveX DLL file to optimise code and improve the security of your ASP pages. The Linux column also has a Web focus this month; it outlines how to set up a secure Linux Web server.

If you are considering a career change, this month's selection of titles in Bibliofile may provide food for thought. We review books on hacking, day trading and starting up an Internet business. If you are considering trading shares online, you should also check out this month's Price Watch (see page 50) for an overview of the costs involved in using online brokers.

Look out for a brand new Workshop section and a revamp of the Windows column over the next couple of issues. The popular Just DIY section will also be returning to Workshop soon. The complete contents of this month's Workshop are listed in the box to the right.

Workshop is a reader input section. Please send your ideas, comments or criticisms to workshop@acptech.net, or to our snail mail address APC Workshop, PO Box 4088, Sydney NSW 1028.



Bug of the month

This month's buggist, who goes by the nom de plume Zombie, has been experimenting with RealPlayer, a program for playing audio and video through a network. When an error occurs, RealPlayer displays a minimal error message and invites you to click on More Info to get, uh, more info.

Fair enough. Unless, of course, the error was caused by the network going down. This creates problems when RealPlayer tries to contact its tech support department via the broken network, leading in turn to more errors.

This just might get repetitive!



Win! Win! Win!

Workshop is always on the lookout for the most interesting, strange, funny or downright weird software bugs you can find. These include code snippets, features that function poorly, or things that crash a particular application. Anything and everything buggy deserves mention.

Send us your favourite bug via email to bugs@acptech.net or snail mail to APC Bug of the Month, PO Box 4088, Sydney NSW 1028, and you'll be in the running to win a software prize. Please send screen captures, example code listings or detailed instructions to trigger a bug in an application, as appropriate for your entry.

The winner's name, along with details of the bug, will appear in this column in APC April. So start hunting!

Michael Smith



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Technobabble looks at the device most computer users couldn't do without — the mouse.

Squeaking it in

Most people don't like mice. Women in '50s sitcoms jump up on chairs to avoid them, they're often found in plague proportions stuffing up crops, and let's face it, Tom deserves to eat Jerry after all the crap he's put him through. However, computer mice are a different story. They're one of the most important innovations behind the popularisation of computers. Most people take computer mice for granted, but few actually understand the technology behind them.

History

The idea of the mouse has been around since the late '50s, when Douglas Engelbart came up with the concept at Stanford research labs. It really came into its own as a computer device when researchers at Xerox's Palo Alto labs tied it to a graphical user interface, and engineers at Apple recognised it as a perfect control device for the Apple Lisa.

The Lisa became extinct (collectors notwithstanding), but the mouse thrived, moving from a square, single button device to the more pleasant, rectangular mouse of the Macintosh. It took a while for the IBM market to pick up on the advantages of the mouse (and indeed, the GUI), but the impetus for improvements in mouse design has come more from the PC community than the Mac in recent years.

Mice with balls

The most common mouse design is still the ball and roller model. A ball is suspended beneath the mouse in a way that allows it to roll across a desk surface. Movement of the mouse is detected by rollers within the mouse, which then measure and translate the physical movement into onscreen movement. The ball is unremarkable; usually a rubber-coated (for grip) sphere of a reasonably standard size.

There can be quite a lot of variation in the rollers, and in how the detection process takes place. The mouse can move in any direction, but most ball mice have detectors for only two directions: an up-down roller and left-right roller. These detectors can be full rolling bars or quite small wheels — and to be honest, there's very little perceptible difference between the pickup of the two types.



Most people who use ball mice have mousepads to aid scrolling accuracy. However, most mousepads don't actually improve mousing accuracy. Confused? Well, unless your pad improves mouse grip (and most don't), it won't provide a more accurate representation of your arm movement.

What the mousepad does do (which most people don't think about) is create a dedicated area of desk space for performing your mousing activities. Most desks are a mess of paper, coffee cups, CDs and assorted detritus, and trying to move a mouse through all that junk is a real challenge. Most mousepad surfaces also tend to remain cleaner than the surfaces of average desks, and with ball-based mice dirt buildup is a real problem.

Optical mice

Optical mouse technology has come a long way. The earliest optical mice used simple sensors that detected a specific pattern imprinted onto a special

mousepad. As the sensors detected the change in the pattern being displayed beneath it, they moved the onscreen cursor. Optical mice have two distinct advantages. First, they can be more accurate. It's much easier to adjust the sampling rate of your scanners and increase the precision in an optical medium. The second benefit of a well-built optical mouse is durability. Beyond the base surface of the mouse there are no moving parts, so they should be far more robust.

Newer optical mice use cheap, charge-coupled device cameras installed in the base. The mouse firmware for such devices must include some image recognition/comparison software, as they no longer rely on specialised mousepads and can be used on any surface. The camera takes a snapshot of the desk surface under and around the mouse base. As the mouse moves, it continues to take snapshots, and compares each picture of the surface below to the previous ones.

If the image appears to have moved to the left, that's the direction the cursor

is moved in. There are some minor drawbacks to optical mice, for example, they don't work well on reflective or glass surfaces as the images presented back are garbled and comparison is impossible. However, there's the advantage of not having to clean the little beggars very often — at least not the sensor anyway.

Mouse performance is often talked about in terms of resolution. It's claimed that higher resolution equals a more precise mouse, but this is slightly erroneous. In reality, a higher resolution mouse returns more movement 'counts' (be they from an optical sensor or a ball sensor) than a lower resolution mouse. This can result in improved accuracy, depending on how these counts are interpreted. For example, if a mouse is said to have 5cpi (counts per inch), each of these counts is interpreted as a specific amount of onscreen movement, say 1cm of onscreen space. So for every inch you move, your onscreen cursor moves 5cm onscreen. If you get a higher resolution mouse, for instance 50cpi, you move 50cm — and presumably right off the screen. Your mouse doesn't move in a more precise way, just faster.

Almost every mouse is set up so that hand movement is smaller than the corresponding onscreen movement. With a higher resolution mouse, you have more space to play with finetuning. If the count is reduced, the onscreen precision can be improved.

Confused? Look again at the example above. If the amount of movement each count represents is reduced from 1cm to 1mm, then for each inch the 50cpi mouse moves, it moves 5cm onscreen — the same as the 5cpi mouse. The difference is that the 50cpi mouse measures each and every millimetre, giving you much finer control over where the mouse stops. At the same time, the 5cpi mouse only takes measurements every centimetre. This is a big difference. It's all a matter of finetuning the mouse.



Protocol demands

The mouse knows exactly what it's doing and where it's going, but unless your system is able to process all this information, you're not going to get a lot of work done. This is where mouse protocols come in.

A mouse protocol deciphers the information sent from the mouse and does the bulk of the translation work. If you're a Windows user, your experience with mouse protocols will probably be very simple — once plugged in, most mice work without any specific prompting.

If you have a slightly funky mouse (with extra buttons for example), there could be specific drivers to install for the extra functions, but for the most part it's pretty much a case of install and forget.

Logitech, Mouse Systems and Microsoft each hawk slightly different protocols, but Microsoft's power in the market means that almost all of them work to the Microsoft 'standard'.

Things are a little more complicated under Linux. Most modern Linux distributions do a good job of picking hardware, but it can be useful to note if there's a specific protocol at work. Most of the time you don't need to bother, but if you do want full function from your mouse (especially if it's fairly new), then knowing the protocol can be the difference between a GUI and a mess.

Reverse the polarity

Another type of mouse is the trackball. Trackballs are especially useful where desk space is at a premium. In a sense, the trackball reverses the mouse equation. A standard mouse moves over a surface to generate its inputs, but the trackball moves over a sensor to produce data. The other main difference is that trackball designers place buttons and balls as they see fit, so there are tiny trackballs that can

be mounted into notebooks and snooker ball-sized monstrosities that are rolled with the open palm, instead of just a few fingers. Trackballs also tend to be designed specifically for one hand or the other. Most

mice are a plain shape that is not specific to either hand, but the placement of buttons and the method of using the trackball (fingers or palm) usually mean that it only works in one hand.

GUI control tools are particularly useful for notebooks. The portability of notebooks makes the use of mice impractical (although most notebooks allow space for at least a PS/2 and serial port).

There are two options for notebook controllers: glidepads and control sticks. IBM is particularly fond of control sticks, which are tiny joysticks embedded between the G and H keys. Other manufacturers use a glidepad, which works with finger pressure on a small pad at the base of the keyboard. Due to their small size, glidepads have a much smaller cpi than similar devices.

Whether you use a mouse, trackball or glidepad, the most important issue for regular mouse users is ergonomics. Most mice aren't ergonomically designed.

Their moulded shapes force your hand into the wrong position, and most people tend to use them for far too long and in the wrong positions.

Some mice are better to use than others. Mice with ergonomic mouldings that match the contour of a hand are much better than those that come in blocky (or wacky) shapes. If you have wrist problems, it may be worth investing in a smaller track-

ball (where the fingers do most of the movement) or a custom ergonomic mouse (such as 3M's Renaissance mouse, reviewed in APC January, page 38).

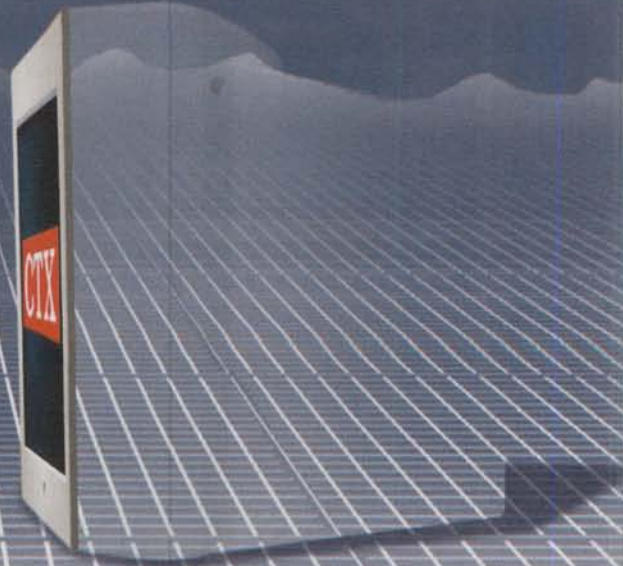
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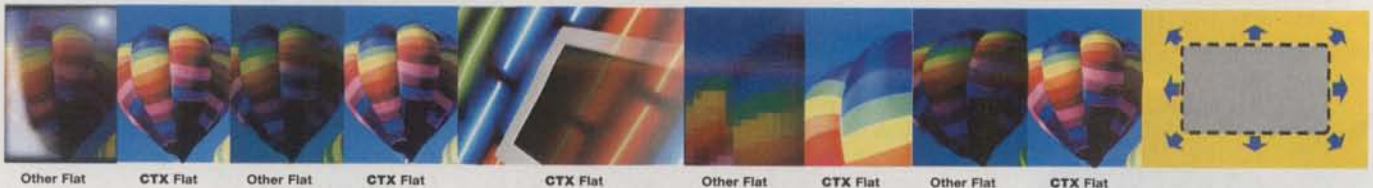
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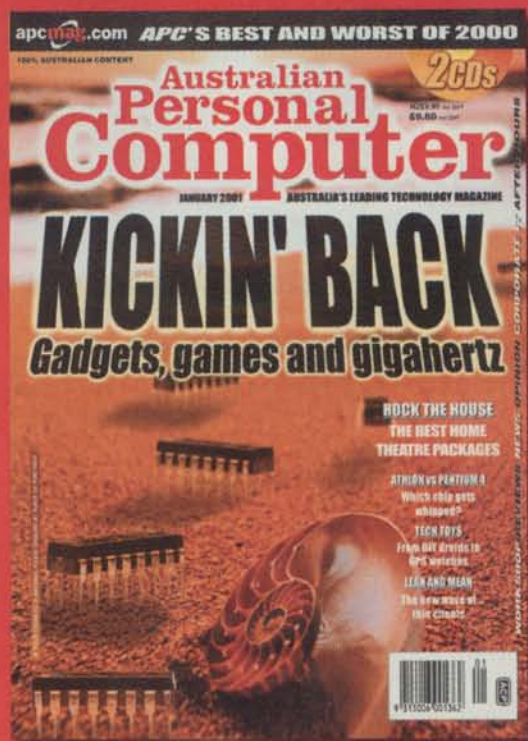


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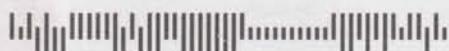
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Why the Flash player is the most widely used browser plug-in.

Flash — saviour of the universe?

Macromedia's Flash allows designers to combine vector and bitmapped graphics, audio elements and animation in a Web-friendly manner. The company claims that 289 million people have installed the corresponding Flash player. This figure was derived from a survey carried out by NPD Research that found 96.4% of Web browsers have it pre-installed, and uses an IDC Research estimate that there are 300 million Internet users. Players are available for Windows, Macintosh, Linux Red Hat and Slackware, and Solaris. A Java version caters for Java-enabled browsers running on other platforms.

Some of Flash's attractions stem from its use of vector graphics. Conventional graphics formats for still or moving images are pixel based. This means a line is defined as a series of dots. Vector graphics usually work by defining a direction and a quantity, or any combination of directions and quantities. So a line is described as having a start, end and quantity in between.

Some formats provide data compression, but most nonphotographic images can be represented more efficiently by vectors than by bitmaps. On the Web, this means shorter download times.

Another advantage is that vector graphics are scalable and therefore resolution independent. The program creating the image works in a virtual space of arbitrary dimensions, drawing lines between coordinates. The rendering software maps that space onto the available screen area. This means that when an image is placed in differently sized browser windows, the original height-by-width ratio is maintained. An image that originally measures 900 by 600 pixels could measure 500 by 333 pixels in a smaller window. The image



is rendered as well as possible in the space available, so designers have control over layout but specific demands are not made on the display. Detail is lost as the image gets smaller, but that's a relatively minor problem. Text and graphics are anti-aliased, so edges appear smooth regardless of the image size.

Other advantages stem from Flash's support for interactivity. Scripting within Flash provides a convenient way of handling rollovers and other commonly used features, and can trigger animated sequences or link to other Web pages.

Flash 3 introduced several features that simplify the construction of attractive images. These include the ability to overlay transparent vector objects on bitmaps, sprite animation (useful for user interface objects such as menus, as well as puzzles and games), and morphing from one shape to another over any number of keyframes.

The advent of Flash 4 brought support for MP3 streaming audio and text forms, and made it easier to program for interactivity. The major change in Flash 5 was the introduc-

tion of the ActionScript scripting language, which is like JavaScript.

A Macromedia survey of Flash users published last April suggested that Flash is most commonly used to create full-screen Web pages. Other popular uses include the design of user interfaces, and authoring long and short-form animations.

"Large corporations are adopting Flash technology as their de facto method of delivering high impact content on their sites, ranging from navigational elements to product presentations to entire sites," Macromedia's senior Internet evangelist Greg Lewis said. High profile examples include the @Home network, US jeweller Tiffany, Warner Bros and Fox Networks.

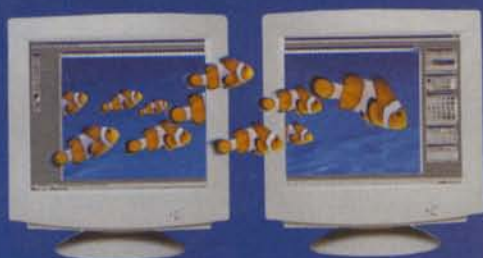
In April 1998, Macromedia moved towards making Flash an open standard by publishing its SWF file format. This means other developers can produce applications that create SWF files that will work with the Flash player. However, at the time of writing, the published specification only goes as far as the compression, playback and scripting facilities of Flash 4. Four months after the release of Flash 5, the specification had not been revised.



▲ Flash 5's startup screen



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"We are currently working diligently to update these specifications to allow developers to update their applications to the Flash 5 SWF format, including a much greater degree of scripting capabilities," Rewis said.

This openness is based on an old model, in which manufacturers would publish file formats and APIs (application programming interfaces) to allow interoperability. The more recent open source model provides the release of the source code, which allows outsiders to see how the software works and use it as a basis for further development.

However, Macromedia does offer a source code licence for the Flash player to developers who want to port it to new platforms or embed it in other applications. The terms of this licence transfer ownership of modifications "that relate exclusively to the performance of the Flash Player including but not limited to software defect fixes, enhancements, and improvements to the Source Code" or "that relate exclusively to porting the Flash Player to a Platform" to Macromedia. Consequently, you won't get rich by porting the Flash player. Other changes such as modifications to integrate the Flash player with another product, remain the property of the developer.



▲ www.nosepilot.com uses Flash exclusively.



▲ www.evobblue.com promotes its Web design services using a Flash presentation.

An online community of SWF developers has formed around openswf.org. As well as a discussion forum, the site provides additional documentation, sample source code and product listings.

Most of the tools for producing SWF files have come from smaller vendors. Examples include Flash Turbine and Swift-Generator (which dynamically insert information from databases and other files into SWF files or Flash templates, much as Macromedia Generator does), Screen-Weaver, FlashJester Creator and FlashForge (which turn Flash files into Windows screensavers), SWiFT and FlaX (to produce quick and easy text effects), and SwiftPEG (MP3 to SWF conversion).

Even Adobe has accepted the pervasiveness of the format and provides SWF export from LiveMotion, its competitor to Flash. Other graphics programs with this capability include Xara X, Swift3D and KoolMoves.

The Flash player is also being built into other software. For example, Apple supports SWF in QuickTime, and version 5 (in beta at the time of writing) even handles Flash 4 scripting within the Flash track of a QuickTime movie. RealNetworks' RealPlayer also supports Flash movies.

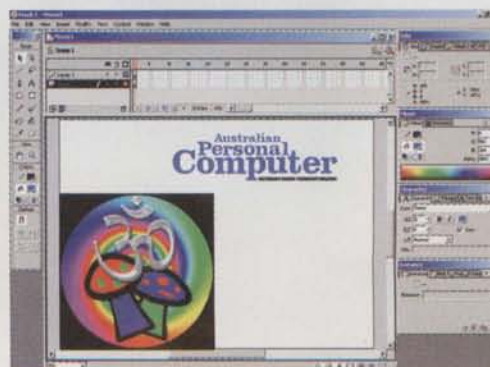
Despite the widespread acceptance of Flash, its dominance is not assured. Scalable Vector Graphics (SVG), a W3C (World Wide Web Consortium) proposal, is gaining support in some quarters. The CSIRO has created an SVG toolkit that contains an SVG viewer, an implementation of the SVG DOM (Document Object Model) and a utility for rendering an SVG document into various image formats. Adobe, Corel, IBM, Jasc and the Mozilla Organisation are supporting SVG in one way or another. Based on XML, the SVG specification reached the 'Candidate Recommendation' stage last August, and there were further revisions in November.

However, Macromedia is not standing still. Apart from the ongoing development of Flash to support increasing levels of interactivity, projects are in hand to broaden the range of supported platforms.

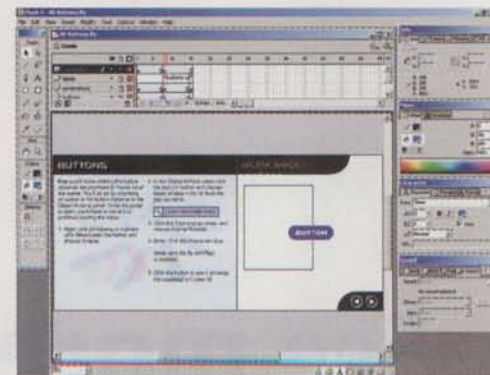
"We are also working with partners such as Microsoft, Palm and the telephone consortium Symbian to



▲ Flash 5's new actions palette



▲ Flash 5's graphical user interface



▲ Tutorials walk you through Flash 5's features.

provide Macromedia Flash player support in these Web-enabled devices. It is our intention to bring the Flash player into any area where Web-connectivity and a slim client makes sense — the current Flash player weighs in at less than 200K. One can envision Web-enabled appliances in the home using the Macromedia Flash player as their interface, allowing for visually appealing designs and applications without requiring a lot of horsepower to drive the application," Rewis said.

"Believe it or not, I've heard rumour of a Web-enabled refrigerator, complete with a Flash-designed interface."

Stephen Withers

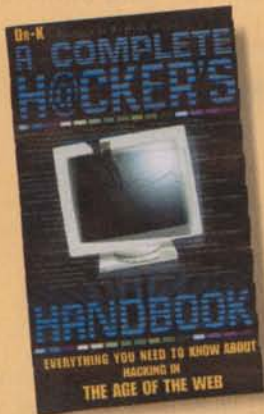
Making mischief and money on the Web, plus all sorts of tips.

Mischief and money making

A Complete H@ckers Handbook

This book is subtitled *Everything You Need to Know About Hacking in the Age of the Web*, but will hackers really benefit from it? The answer is not really. Anyone with access to the Net can probably find just as much information in a few hours of browsing.

The anonymous Dr-K, a nerd from way back, presents plenty of information on the main ways to exploit weaknesses in operating systems, mail programs, test applications and networked installations. He also includes excellent insights into how hackers work. He describes some simple yet effective methods for compromising systems using common tools such as PING



and CGI scripts, NetWare supervisor temporaries and a walkabout phone with crocodile clips on the connectors. There are also chapters on virus creation and MP3 manipulation, but this information can easily be found on the Web.

Most importantly, the book offers a huge amount of useful information on how *not* to let hackers gain access to your system. For this reason, security conscious organisations will find it good value.

Hackers would probably learn more by hanging around the right chatrooms.

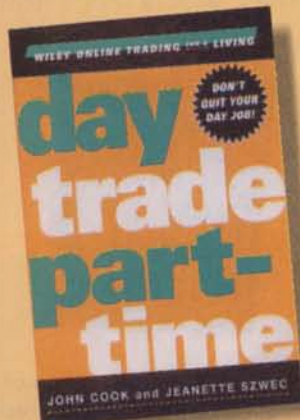
Jeremy Torr

Author Dr-K
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Phone (03) 9871 2400
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ISBN 0140296379
Rating ■■■■■■■■

Day Trade Part-Time

The authors of this book started day trading stocks on a part-time basis and claim to have made every mistake imaginable. The book isn't a 'how to' manual that teaches you the intricacies of trading. Instead, it helps you decide if you want to day trade in the first place. If you do, it answers some of the commonly asked questions and directs you to a range of educational tools. This is a different approach from that taken by other books on the subject.

John Cook and Jeanette Szwec offer a 'SureStart' guide — their personal recommendations on a range of choices such as brokerages, trading sites and educational programs. As the book is written and pub-



lished in the US, some of the reference material and SureStart recommendations are not relevant for Australian readers.

Day Trading Part-Time is a good book if you're considering flirting with online day trading. It won't provide you with sufficient information to begin trading, but it will help you decide if day trading is for you. It is also a good reference if you've already completed some preliminary reading and investigation. The Web site references and SureStart tips are especially useful.

Cathie Kennedy

Authors John Cook and Jeanette Szwec
Publisher John Wiley & Sons
Contact John Wiley & Sons
Phone 1800 777 474
Price \$49.90
ISBN 047139310X
Rating ■■■■■■■■

Startup.com

This book is aimed at those who already have a basic knowledge of how to start up a Net business, and is not meant to be a step-by-step guide for budding entrepreneurs.

A few editing oversights suggest the articles in this collection were originally written for a different purpose, and are not specially commissioned pieces. For example, there are references to announcements made "this week", and phrases such as "this article" rather than "this book".

It covers central issues such as building a business plan, recruitment, intellectual property rights, raising capital and legal matters quite broadly. The only topic it doesn't adequately cover is financial planning, which is limited to a little over three



pages. Considering the subtitle, *Everything You Need to Know About Starting Up an Internet Company*, the financial side deserves more than superficial coverage.

Startup.com was written and published in the UK, and although some of the information is UK and Europe-specific, the majority is relevant to Australian readers.

This book is a good place to start researching dot com company ideas, and a worthy addition to your bookshelf. It won't tell you *everything* you need to know, but it certainly provides a sound starting point.

Cathie Kennedy

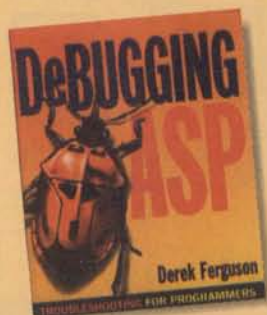
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Debugging ASP: Troubleshooting for Programmers

Debugging ASP deals with a rather neglected subject in the Web developer market. There are plenty of books on all levels of ASP programming, but there are none that specifically target the problem of debugging.

Most programming languages, have their own programming IDE, but with Active Server Pages you usually have to debug through a tedious process of deconstruction or trial and error. As a result, any advice on how to streamline the process is warmly welcomed by developers. However, this book is not really a DIY debugging manual. It's more of a guide to sidestepping common problems and avoiding situations that require difficult debugging.

This is not just an introductory manual either. It is an intermediate-level guide to the majority of ASP development situations.



Rather than explaining the details of programming in these cases, it focuses on methods of writing better and faster code to minimise the likelihood of difficult debugging situations. Like preventative medicine, the book treats causes, not symptoms.

At \$69.95, *Debugging ASP* is reasonably priced. There is no accompanying CD, but this is unlikely to deter readers. Aimed at those already into VBScript, the book's emphasis on fixing errors when they occur sets it apart from most ASP texts on the market.

Daniel Potts

Author Derek Ferguson
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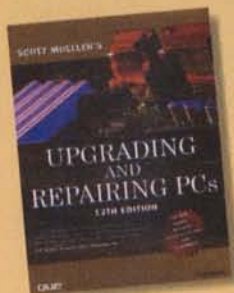
Upgrading and Repairing PCs

This is the 12th edition of *Upgrading and Repairing PCs*, and at just under 1,630 pages plus a very full CD-ROM, it's bigger than many of the newer compact PCs it talks about.

Inside is a tinkerer's dream come true — tables, spec sheets, DIPswitch and jumper settings galore, and an explanation for almost every kludge or conflict the current generation of PCs can come up with.

However, author Scott Mueller hasn't forgotten the central aim of the book. There are specs and settings for older RAM types, 486es, small-capacity SCSI drives and a host of less-than-common components.

The diagrams are rather few and far between, but this is offset by the video sections on the CD-ROM. These detail upgrades and common replacement scenarios. The book also ventures into slightly more exotic territory with comments on



overclocking and a section on notebooks, but doesn't really offer much considering their complexities.

There is a new section on connectivity which covers ISDN, cable, dialup, satellite and networks, and each chapter offers basic troubleshooting for its subject area.

The CD is similarly comprehensive, with video sections, manufacturers' PDF reference documents, and even four previous editions of the book which you can print out to access older spec component tables. If you have ever taken the case off your PC, this book is for you.

Jeremy Torr

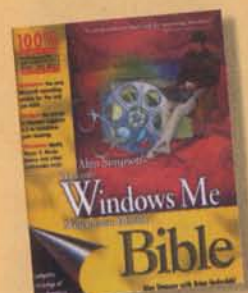
Author Scott Mueller
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Alan Simpson's Windows Me Bible

Nobody is likely to read this book's 900-plus pages from cover to cover, but if you did, you'd end up with a solid grounding in Windows Me. A more typical approach would be to dip into the What's New chapter and then follow up on the topics that particularly interest you.

The book isn't particularly expensive for its size, but the publisher has apparently economised on the paper quality. The print shows through from one side of the page to the other, making the plentiful screenshots appear muddy. Another problem is that like other books about software which are produced to rushed schedules (usually between the appearance of late betas and the final release of the software), there are some errors. In this case, incorrect images and an incorrect special character have been overlooked.

Much of the content is pitched at a basic level, and most advanced users



won't find this book good value for money. It should satisfy those with an intermediate skill level. Compared with the *Windows Millennium Missing Manual* (see *APC* January, page 126), this book goes into greater depth and is also more useful as a reference. This is because the length of Simpson's book allows for greater coverage.

Stephen Withers

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*Defragment your hard drive
without going to pieces.*

Putting it back together

Some computer users are very enthusiastic about defragmenting or 'optimising' their hard drives. Files get fragmented as a natural consequence of data being written to and deleted from a drive. For instance, imagine creating a 5M file occupying a continuous string of clusters on a drive that is nearly empty. (A cluster is the smallest data-storage unit the file system supports.) When your drive finds the beginning of the file, it doesn't need to look elsewhere on the disk for other parts.

However, if you delete that file and write a new 10M file to the drive, the file system may elect to put the first half of the file where the old 5M file was, thus fragmenting the file. It'll be in two pieces on the disk, and to read it the drive will have to move the heads to read the first part, then move them again to read the second.

As time goes by and more read/write operations are carried out, the drive gets even more fragmented. Large files can end up broken into dozens of fragments. Defragmenting the drive juggles all of the data around, putting as many files as possible in continuous strings of clusters, and putting all of the free space in one block.

Modern defrag programs also put more frequently accessed data on the faster, outer tracks of the drive. Data is stored at a constant density all over the disk, so the outer tracks have more disk surface and thus hold more data. The rotational speed is constant, so when the head reads the outer track, it reads more data at the same speed it would for an inner track. This means it effectively reads data faster on the outer tracks.

However, fragmentation doesn't have nearly as much effect on system performance as many people think, so there's no

need to do it repeatedly. The hard drive only contributes to 10% of the overall performance of a Windows system, so even if you make the drive twice as fast, you only make the computer about 10% snappier.

In any case, defragmenting isn't likely to improve the speed of your drive by a factor of two. For example, if you have a big data file in 10 fragments, and each search the drive does takes 20ms, that's only an extra 0.2 seconds of load time for your multimegabyte file. If you're running a multiuser machine, this can make a noticeable difference; if you're not, it won't.

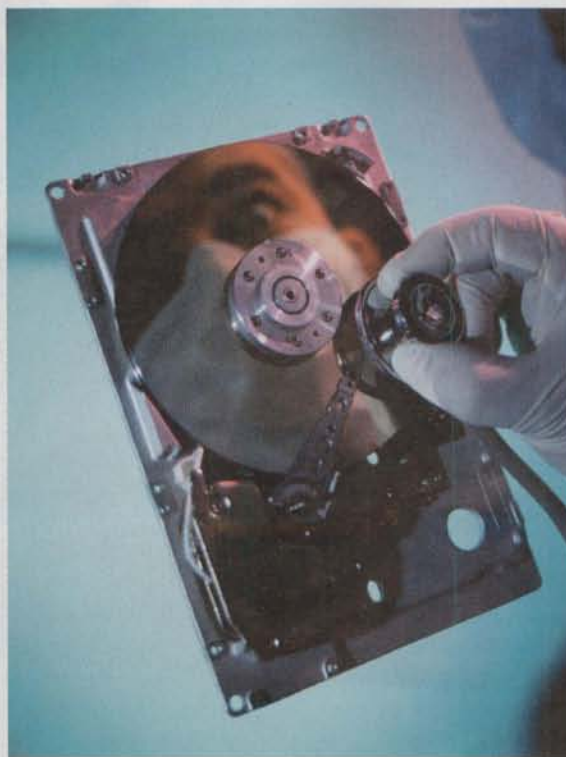
Many defrag programs, including those that come with Windows 98 and Windows 2000, are unable to defragment the swap (or page) file, which is the large file on the hard drive that's used for virtual memory data. The swapfile is the hardest-working file on a desktop PC's hard drive, so this means you don't get to defragment the part of the drive that needs it most.

If your swapfile is fragmented, you can still defrag it in Windows 95 and 98 using the default defragmenting utility program Disk Defragmenter.

Go to Control Panel, select **System**, **Performance and Virtual Memory**. Click the 'Let me specify...' radio button and the 'Disable Virtual Memory' box. This is not recommended by Microsoft because without virtual memory, Windows generates an 'out of memory' error when you hit the end of your physical RAM. This can happen very quickly when you start running almost any program.

However, if you've got at least 64M of physical RAM, Windows should have enough memory free to run Defrag, even with no virtual memory. As you've disabled the virtual memory, there's no swapfile to defragment.

Restart and optimise the drive with Disk Defragmenter, and it'll give you a block of free space. Now, go back to the Virtual Memory settings and turn the swapfile back on. It'll then be created in the newly freed space.

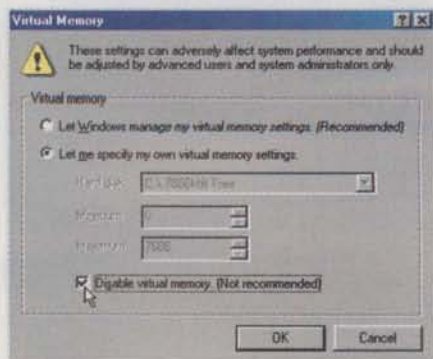


If you want to reduce the likelihood of the swapfile being fragmented again, set a minimum size for the file. What that size should be depends on the programs you run, but 256M minus your physical RAM is likely to be more than enough for most people.

Windows 2000 can't run without a swapfile, but it automatically creates one if the drive on where the swapfile is located is removed. Before you defragment, you can shrink the swapfile to minimum size by going to Control Panel and choosing **System**. Select the **Advanced** tab and click **Performance Options**. Change and set the maximum page file size to the smallest setting you can.

Windows 2000's standard disk defragmenter is a cut-down version of Executive Software International's Diskeeper. The full version of Diskeeper can defragment the swapfile without all this fuss, as can every good commercial Windows 95 or 98 disk defragmenting utility. You can download a free 30-day trial version of Diskeeper from Executive Software International at www.execsoft.com/execsoft.asp.

Daniel Rutter



For a complete archive of APC Step by Step columns, see apcmag.com.

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Set your RAM free

The standard amount of RAM included with new computers has gradually risen over the last few years from 16M to 128M. However, even 128M is quickly consumed by running several applications at once, playing large video or music files, or simply — in the case of Windows — using your computer for too long without rebooting.

The latter has been a longstanding problem for Microsoft. It has continually sought to develop new ways of improving Windows' memory management for more effective multitasking. Perhaps the biggest improvement came with Windows 95. It replaced clunky DOS memory drivers with an improved memory management system that uses hard drive space to extend the amount of addressable RAM available to applications.

However, hard drives are far slower than memory. Ideally, the system needs to make the best use of fast physical RAM while minimising its dependence on

hard disks. To facilitate this, Windows 95 includes a new driver called VCACHE, which administers a virtual cache inside your physical memory to keep the most frequently used data close to hand.

To improve the accuracy of the cache, Windows incorporates a read-ahead optimisation feature, which continually tries to predict what data an application is going to request next and reads it into physical memory before it's actually needed.

Unfortunately, the cache Microsoft came up with still leaves a lot to be desired. For example, in Windows 95 memory is allocated to applications in chunks, but these chunks aren't always freed up when the applications are finished with them. This means the conventional memory quickly fills up, forcing newly opened applications to rely more heavily on hard drive-based virtual memory.

Windows 98 improved on this memory arrangement, but there is still some room for improvement. VCACHE can grow to a surprising size, particularly on systems that use a lot of multimedia content, and it is often quite recalcitrant when asked to relinquish its memory to other applications. Over time, an improperly configured cache can become a major performance drag on your PC. In extreme cases, out-of-memory errors and application problems are commonplace, even on systems with large amounts of RAM.

However, there is a relatively simple way to improve the efficiency of the system cache. Cache settings are controlled by the [vcache] section of C:\windows\system.ini, which you can access through Start, Run, sysedit. Another way to edit the cache settings is to download CacheMan, a freeware program from Outer Technologies (www.outertech.com). This small utility provides sliders to change cache settings, as well as those that control disk filename caching.

To find out just how much incorrect cache settings can affect system performance, APC ran a series of tests using different combinations of settings. Each time we changed the settings, the available free

Tweaking your cache settings can improve RAM performance.

Windows shareware

DreamKeys 1.2.2

Keyboard shortcuts are much faster than using the mouse.

FTP Voyager 7.2.2.0

Download and upload files with this great FTP client.

PC Accelerator 5002 SE

Use this program to configure your computer to its optimal levels.



RedBox Organizer 4.0

Use this calendar, planner and address book to organise your life.

Spam Killer 2.81

Get rid of annoying junk email with Spam Killer.

These programs and others can be found on this month's cover CD, along with more detailed reviews.

memory was measured immediately after bootup to the Windows desktop and then the Disk WinMark section of Ziff-Davis Media's widely-used WinBench 99 application (www.zdnet.com/etesinglabs/filters/benchmarks) was run. This benchmark is the one most likely to be affected by disk cache performance because it measures Windows' ability to move data onto and off



Test results: RAM performance

Trial	Business Disk WinMark	High-End Disk WinMark	Cache size — min (K)	Cache size — max (K)	Chunk size (bytes)	File cache	Directory cache	Free physical RAM at bootup (K)	Swap file space used on boot (K)
Trial 3	1,930	4,820	16,384	45,000	4,096	3,382	128	51,316	97,316
Trial 2	1,840	4,810	4,096	45,000	4,096	3,382	128	51,104	97,288
Windows default	1,820	4,760	1,024	8,192	16	337	16	81,780	95,964
CacheMan — 3D games	1,900	4,700	1,024	6,144	1,024	2,048	48	33,128	103,232
Trial 5	1,880	4,620	16,384	45,000	1,024	3,382	128	44,540	97,412
CacheMan — power user	1,380	3,570	1,024	10,240	2,048	4,096	96	74,704	102,876
Trial 1	1,430	3,510	4,096	20,035	4,096	3,382	128	70,144	95,944
CacheMan — CD writer	1,250	3,350	10,240	10,240	512	6,144	128	75,304	103,256
Trial 7	1,780	2,570	61,000	82,616	4,096	3,382	128	51,484	97,320
Trial 8	1,620	2,040	16,384	32,767	4,096	3,382	128	57,452	96,636
Trial 9	639	2,030	40,960	40,960	4,096	2,048	64	43,588	102,624
Trial 6	717	1,960	41,308	82,616	4,096	3,382	128	8,780	83,574
Trial 4	1,740	1,730	16,384	45,000	2,048	3,382	128	44,264	96,144
CacheMan — multimedia	1,240	1,510	4,096	10,240	4,096	6,144	128	74,536	103,116

Trial order is determined by High-End WinMark 99 results.

Benchmark results were obtained using eTesting Labs Inc.'s WinBench99 version 1.2, and were performed without independent verification by eTesting Labs Inc. eTesting Labs Inc. makes no representations or warranties as to the result of the test. WinBench is a registered trademark and WinMark is a trademark of Ziff-Davis Publishing Holdings Inc., an affiliate of eTesting Labs Inc., in the US and other countries. The test system was a single-processor Compaq Presario model 5726 with 500MHz Intel Pentium III, 160M RAM and 1M L2 RAM cache running Windows Me. The hard disk was a 15G Maxtor Fireball IDE drive, using FAT32 file system and VIA Bus Master PCI IDE Controller. All products used in the test were shipping versions available to the general public.

the disk while simulating a variety of real-world applications.

VCACHE has three settings: minimum cache size, maximum cache size and chunk size (the size of memory chunks allocated to applications). Fiddling with these settings produced some very different Disk WinMark results (see table). The Windows default configuration measured up reasonably well, but slightly better performance was achieved with some tweaking.

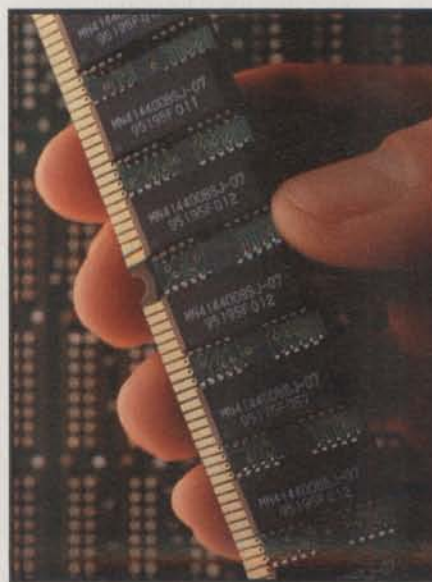
Many Web sites describe easy techniques for improving VCACHE performance; one site recommends fixing the cache at one-quarter the amount of installed RAM. However, doing so produced absolutely miserable results in APC's tests. The only good way to ensure you're getting maximum performance is to do the hard work yourself.

Streamline the startup process

Improving cache settings can produce a noticeable increase in system performance, but there's another easy way to squeeze more speed out of your system. You can optimize the collection of startup tasks that are loaded when Windows boots up.

Many startup items are contained in the Start, Programs, Startup folder, and you can add your own by dragging shortcuts into the folder. Plenty of other appli-

cations make their way into your startup process, but are not reflected in the StartUp folder. These are usually applications that run in the background and often serve no particular function except to consume memory.



To find out if your system is being slowed down by these unnecessary applications, go to Start, Run, msconfig. This is a built-in diagnostic tool that allows you to selectively load drivers, configuration settings and environment settings in order to fix problems or tweak performance. You can click on the Startup tab

to see what your system is loading without your knowing.

APC's test system carries only a moderate number of applications, but showed 35 different Startup entries, many pertaining to applications we no longer use or don't need to keep available all the time. We disabled Sonique's Quick Start tool, something called mp3creator, applications that put the unnecessary Real Networks and annoying RealDownload tools in our taskbar, and six applications Compaq included on the test system to enable its unnecessary online support and diagnostics.

After rebooting Windows, the msconfig changes produced a major improvement in memory usage. Before startup, CacheMan reported 29,040K of physical memory free and 125,012K of used virtual memory. After disabling 11 unnecessary startup items and rebooting, CacheMan reported 48,348K free and just 97,276K used — that's an extra 19M of RAM and 28M of virtual memory to run applications with.

Results vary depending on your system configuration, but don't be afraid to experiment. Uncheck the things that look obviously unnecessary, then try disabling others that you're not sure about. If anything stops working correctly, just go back and re-enable the settings you changed.

David Braue



For a complete archive of APC Windows columns, see apcmag.com.



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Set up a secure Linux Web server with
Secure Sockets Layer protocol.

Secure serving

This month, we take a look at how to set up a secure Linux Web server using SSL (Secure Sockets Layer), the protocol that allows data communications to be encrypted. SSL can be used to encrypt NNTP (Telnet), POP (email) and other protocols, but the wide availability of Web servers and Web browsers (such as Netscape and Internet Explorer) that support SSL means it is most commonly used for encrypting HTTP transactions.

Using a range of techniques, SSL is able to encrypt communications between a Web browser and Web server, and provide assurance to users that they are really communicating with the Web site they think they're communicating with.

Introducing SSL

To set up an SSL server, you need to know a bit of cryptography terminology. SSL uses cryptographic keys. These keys are very big numbers hundreds of digits long that are generated in pairs using mathematical formulae. One of the numbers is called the *public key*, and the other is called the *private key*. The public key can be shared with anyone, but the private key must be kept secret.

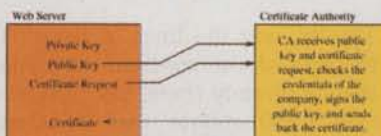
The private and public keys are mathematically related in such a way that anyone can encrypt a message using the public key, but only the server holding the private key can decrypt it. The way this works is beyond the scope of this column, but if this sort of thing interests you, the *RSA Laboratories' Frequently Asked Questions About Today's Cryptography* (www.rsasecurity.com/rsalabs/faq/index.html) is worth reading.

There's more to secure communication than just being able to encrypt and decrypt messages. How can you be sure that the public key you have really belongs to the person you think it does? The answer to this is digital certificates.

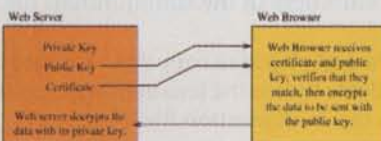
A digital certificate is a public key that has been signed by a trusted third party, called a certificate authority (CA). How these work is the subject of more maths, but it's sufficient to know that CAs sign the public keys of a company's Web server after verifying its credentials. Based on this certificate, you can be certain of the identity of the server you are communicating with. Similarly, Web users can obtain a certificate proving their identity to a Web server, but this is far less common.

Figure 1 illustrates the process of obtaining a certificate. After creating the public and private keys, the system administrator creates a certificate request, which contains information such as the name of the company and the name of the Web site. The certificate request is sent to the CA, which checks that the domain name really belongs to the company. If it is satisfied, the certificate is signed and sent back.

Figure 2 illustrates what happens when a user connects to the Web site. First, the server sends the browser its public key and certificate. After checking the certificate, any data to be sent is encrypted with the public key, which the server can decrypt with its corresponding private key.



▲ Figure 1: Acquiring a digital certificate



▲ Figure 2: Sending data with the public key

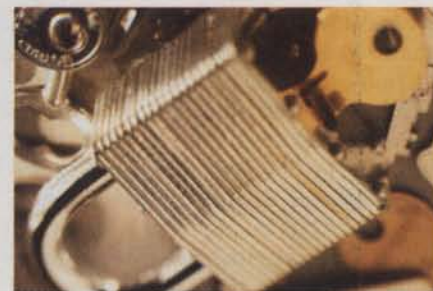
This explanation is rather simplistic, but the concepts described are sufficient for you to get your own secure server running.

Implementations

There are two competing free implementations of SSL under Linux — *mod_ssl* (www.modssl.org) and *Apache-SSL* (www.apache-ssl.org). Both are extensions to the Apache Web server. The more commonly used implementation is *mod_ssl*.

You can install *mod_ssl* by downloading the source code and compiling it, but it's not recommended unless you have a lot of experience with building software. It can be a trial even for seasoned Linux users, especially when additional Apache modules such as PHP are required. If you are running Red Hat Linux 7.0 or Mandrake 7.2, installing *mod_ssl* and *openssl* packages is just a matter of installing the *mod_ssl* and *openssl* packages that come with the distribution.

Red Hat Linux 6.2 users can obtain pre-compiled *mod_ssl* and *openssl* packages



from www.megaloman.com/~hany/RPM/mod_ssl.html and www.megaloman.com/~hany/RPM/openssl.html. Make sure the version of *mod_ssl* corresponds to your Apache version (for example, *mod_ssl-2.7.1_1.3.14-1.i386* corresponds with *apache-1.3.14*), but if you are running an Apache version before 1.3.14, you should upgrade your version of Apache, as security fixes were added in 1.3.14. Mandrake 7.1 users can get cryptographic packages from FTP sites listed at www.linuxmandrake.com/en/ncrypto.php3.

Generate the keys

To generate the public and private keys, run the following command.

```
openssl genrsa 1024 > www.example.com.key
```

This creates a file called 'www.example.com.key' which contains both the private and the public keys. The filenames aren't important, but it helps if you give them meaningful names, especially if you are setting up more than one domain, so substitute your own server name. For added security, encrypt the private key with your own password using the following command to generate the keys instead.

```
openssl genrsa -des3 1024 > www\
.example.com.key
```

This added security is valuable because if someone steals the key file, they cannot get your private key (which would allow them to impersonate your Web server). However, the Web server needs to be able to decrypt the private key, so you need to tell it the password every time you start the server.

Create a certificate request

To create a certificate request, also known as a certificate signing request (CSR), run the following command.


```
openssl req -new -key www.example.com\
.key -out www.example.com.csr
```

You'll be asked a number of questions, such as your country (AU for Australia), state, city, company name, department (or registered business name), common name and email address. If you're asked for any extra attributes, it's OK to leave them blank.

All of the information in the CSR is important, as it is used to verify your identity. The only field that needs explanation is the one for your common name, which is the name of your server. In our example, this is `www.example.com`. As browsers check the name on the certificate against the site name the user is connecting to, a certificate is only valid for one hostname.

You can now send off a request that the certificate be signed by a certificate authority such as Verisign (www.verisign.com) or Thawte (www.thawte.com). The fee is about \$US100 to \$US400.

Self-signed certificates

While waiting for your certificate to be signed by your chosen CA, you can create a temporary *self-signed* certificate which allows you to get started. It's not a good idea to run a site this way permanently, because it generates a lot of warning messages for browsers. The command to sign your own certificate is listed below.

```
openssl x509 -req -days 30 -in www\
.example.com.csr -signkey www.example\
.com.key -out www.example.com.crt
```

Set up Apache

Now that you have a public key, private key and certificate, you can set up Apache through its configuration file, which is usually `/etc/httpd/conf/httpd.conf`. Put it in an editor and make the following changes.

Linux source code

Listing 1

```
VirtualHost _default_:443>
ServerAdmin webmaster@example.com
DocumentRoot /home/httpd/html
ServerName www.example.com

SSLEngine on
SSLCertificateFile /etc/httpd/conf/ssl.crt/www.example.com.crt
SSLCertificateKeyFile /etc/httpd/conf/ssl.key/www.example.com.key
</VirtualHost>
```

- Look for the lines that begin with 'LoadModule', and add the following line to the end of the list if it's not already there. This requests that Apache load the SSL module into memory when starting up.

```
LoadModule ssl_module modules/libssl.so
```

- Look for the lines beginning 'AddModule', and add the following line to the end of the list, if it is not already there. This makes the SSL module available for use.

```
AddModule mod_ssl.c
```

- Next, find the line that says 'Listen 80'. If it's commented out, uncomment it, and if it's not there at all, add it to the bottom of the file. Repeat this process for 'Listen 443'. These two lines ensure that Apache listens on the secure HTTP port (443), as well as the regular HTTP port (80).

- Finally, add the lines in listing 1 to the end of the configuration file. If they're already there, just update the 'SSLCertificateFile' and 'SSLCertificateKeyFile' lines. Ensure that the 'DocumentRoot' line matches the other 'DocumentRoot' line located elsewhere in the configuration file.

The last step is to copy your key and certificate files to the locations you specified in the configuration file.

Accessing your SSL server

When adding or removing keys or certificates, you need to restart the server completely with the following command.

```
/sbin/service httpd restart
```

If the server starts without error, you can test it by going to <https://www.example.com>. The URL begins with 'https' rather than 'http' because it opens a secure rather than regular HTTP connection.

With the default configuration, the entire contents of your Web site is accessible through both HTTP and HTTPS. If you want the secure version of the site to have different content, change the DocumentRoot directive so that it points to another directory.

Linux freeware

Akopia Interchange

This is an ecommerce merchant system for creating and administering a Web-based storefront.

Gnapster

This is the latest version of the popular Napster and OpenNap client for Linux.



Gnome Toaster


A CD burning application, Gnome Toaster has a simple Gnome-based drag-and-drop interface.

PMFirewall

A firewall utility for Linux, this helps prevent your network being broken into.

Websphere Homepage Editor

This is the latest version of IBM's WYSIWYG HTML editor for Linux, and is extremely easy to use.

 These programs and more can be found on this month's cover CD, along with more detailed reviews.

Security

SSL Web servers are often referred to as secure Web servers, but this is a bit of a misnomer. SSL encrypts data travelling between a client and server with a strong algorithm, but this doesn't mean that the Web server was set up so that crackers can't get in, and it doesn't necessarily mean that encrypted data such as credit card numbers are handled responsibly once they reach the server. Administrators of SSL Web servers need to be extra careful about security.

Geoffrey Bennett

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 For a complete archive of APC Linux columns, see apcmag.com.

Pick up some handy tips on
travelling with your PDA.

Are we there yet?

There are many ways for travellers to make the best use of their Palm devices. This month, we suggest some ways to utilise the Palm's built-in applications for travel. We also look at extra applications you can use to enhance your Palm and provide new features for travelling.

A logical starting point for using your PDA to travel is to enter all your travel details into the calendar, notes and contacts on your desktop PC and then HotSync it with your handheld device.

Information can be accessed more quickly by creating a category called 'travel' under each Palm application. Categories allow you to separate travel-related information in an instant. For example, a new task item can be used to ensure everything is packed and organised before you depart. You can create a new category in the to-do application for your travel needs, and even divide it into subcategories such as packing, people to contact, things to do, and so on. From here you can quickly switch between categories by tapping on the Category menu in the upper right-hand corner of your to-do application.

A travel category in your memo application is also very useful. You can enter detailed notes on hotel contacts, taxi information, important travel directions, flight details, baggage contents, and so on. Make sure you label the first line of your memo with a clear description of its contents to make browsing information easier.

The date book application can also be used to store flight information, hotel check-in and meeting times. It makes sense to store information that is time



dependent here, rather than in a memo. Alarms can be set to remind you of important appointments, and details can be stored as an attached note to the appointment by tapping on the Note button when you create or edit the event.

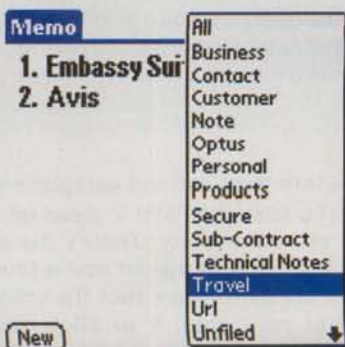
Don't forget to run the Preferences application and set the correct time and location if you've travelled into a different time zone. This ensures that any alarms you've set will go off at the correct time.

If you travel a lot it may be useful to create a name card in the address book for airlines, car rental businesses and hotels. You can attach notes to these entries with information such as membership numbers, frequent flier details, room numbers, service ratings and travel directions. You can also store this information in a travel category and add contact information that you

collect during your trip to keep track of the contacts you make.

The expense application can be invaluable for tracking travel expenses. It handles a wide range of expense categories and currencies, and even allows you to associate expenses with people you met with by performing an address book lookup and inserting it into the expense entry.

Creating a category for each trip can help you track each excursion separately. Once you return to your desktop and perform a HotSync, this information can be imported into a Microsoft Excel spreadsheet by going to your Start menu, Programs, Palm Desktop menu and selecting the Expense Report program. This launches Excel and asks you if you want to enable macros. If you say yes, you are led through the process of creat-



▲ A travel category in your memo application allows you to separate travel information instantly.



▲ Create a name card in the address book to list airlines, car rental businesses and hotels.



▲ The expense application can be invaluable for tracking travel expenses.

Music in your pocket

Pocket PC and Windows CE PDAs can now play digital music. A smaller version of Windows Media Player is standard with all new Pocket PCs and is downloadable for older devices from www.microsoft.com/windows/windowsmedia/en/download/default.asp. The PDA version is a little different from the full-blown desktop PC version. It can't play ASF video files or MP3 files, but does handle Microsoft's preferred format for digital music, the WMA file. Many new Pocket PC owners become excited about the possibility of playing digital music on their PDA, but they usually surrender to the limitations of the operating system and hardware. However, there are ways to get around these.

Many Pocket PC users discover early on that once all their data and applications have been installed, the remaining built-in memory is hardly enough to store more than one or two digital music files. This sounds like an easy problem to solve: just buy some CompactFlash memory. Well, not quite.

Most Pocket PCs have a maximum connection speed of 115,200Kbps. Even most of the fancy new units on the market that provide a USB cable to your PC actually connect to your PDA through a serial connection. This creates a data transfer bottleneck, preventing a high-speed USB connection. Even though you have a massive amount of storage on your PC card, it takes a very long time to get the music from your PC to your PDA. For example, a 64-minute CD that was ripped at 96Kbps on a 650MHz desktop PC took APC 40 minutes to transfer to a Hewlett-Packard Jornada 548 Pocket PC. This doesn't include the time it took to convert it into WMA format.

A true USB connection, which can be found on only a few Pocket PC devices (although many standalone MP3 players have one), can transfer the same amount of information in just over one minute. This limitation can make your Pocket PC cumbersome to use as an MP3 player.

There are ways around this transfer rate problem. A Type II PC Card adaptor allows you to insert the CompactFlash card into a laptop computer or a desktop computer with a CompactFlash card reader/writer. Once installed, the card is registered by



▲ Microsoft Media Player allows you to play Microsoft WMA files.

your Windows computer as a standard PC disk drive. You can copy files directly from your desktop PC as if it is another disk drive. This is much faster than using a serial port or even a USB connection. These devices can be purchased at good software retailers or over the Internet, and cost about \$10 for a typical laptop adaptor for a PC Card, and between \$65 to \$140 for a reader that plugs into a PC. The price for the PC Card reader depends on whether you want a USB, parallel or FireWire connection to your PC.

However, once you improve the transfer rate, you have other problems to face. When using the Windows Media Player on your PDA, there is a problem with the Windows Media Rights Manager that Microsoft has developed to protect music producers from unauthorised duplication and distribution of music files. Unless you use Windows Media Player or media transfer utility on your PC to transfer music

to your PDA, you'll get the error 'The license for this media file cannot be found. To get the license, use Windows Media Manager for Pocket PC to reload the media file.' If you copy the files to your CompactFlash card, you won't be able to play them using Windows Media Player. If you have a high-speed USB connection, there shouldn't be any problem, but you must use the Microsoft Media Manager or the Windows Media Player on your desktop PC to transfer files. Copying them across doesn't necessarily work.

Fortunately, third-party multimedia players such as Pocket Player from Conduits Technologies (www.conduits.com/ce/player) allow you to play standard MP3 files that don't use any security for your music files. Insert your CompactFlash Card into the card reader on your PC and any files you copy to it are ready for use on your PDA. The same CD that took 40 minutes to transfer over the serial/USB connection took less than one minute to copy directly to the CompactFlash card. Another advantage of using third-party players is that MP3 files are left in their original format and not converted to WMA format. Microsoft WMA files have excellent quality sound reproduction when ripping directly from CD, but there can be significant loss of quality when converting MP3 or other formats to WMA. There is noticeable popping and cracking in converted files, especially if the bit rate of the MP3 is different to that of the WMA file.

Battery life is worth watching when using your Pocket PC as a digital music player. APC tested a new Pocket PC by playing MP3 files for about an hour, and found that the batteries were drained to about one-quarter of their capacity in that time. The new unit used fresh, fully charged batteries. Clearly, if you use your Pocket PC as a music player too much, you'll find it runs out of power before the day is over. However, battery technology is improving significantly and units such as the Compaq iPaq offer nearly twice the battery capacity of standard Pocket PC units.

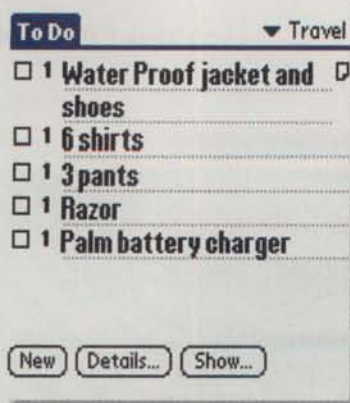
ing an expense report. The format is a simple Excel spreadsheet that can be easily edited to meet your company's expense claim requirements.

To preserve your data it is important to manage your battery usage. Using AAA batteries in some Palms can be expensive, but you have the flexibility of being able to purchase replacements almost anywhere. The Palm V, Vx and

IIIc have built-in rechargeable batteries, which can cause problems if your battery runs out while travelling, because it can't be replaced easily. You can purchase a charger for your Palm that is specifically designed for travel. These range from about \$95 to \$135, depending on what you need. If you have a Palm IIIc, you can get the standard Palm IIIc recharge kit or Palm IIIc Auto/Air recharge kit that

plugs into most car and aeroplane electrical outlets. The Palm V series offers a little more flexibility. There's the standard Palm V recharge kit and a product called the Synchronizer that fits onto the back of your Palm V to allow you to recharge using standard AA batteries.

Another important issue to consider is how you back up your data while away from the office. Last year, this column



▲ You can create a new category for your travel needs in the to-do application.

described how to set up a modem to do a remote sync to your desktop PC (see APC, March 2000, page 147). If you have Backup Buddy and a modem, you can back up your data to your free Driveway account over the Internet. Driveway accounts are also useful for storing personal and shared files securely on a server that can be accessed with a standard Web browser. Backup Buddy provides a more comprehensive backup of your Palm on your PC, and also backs up critical data through a

modem and Internet connection to your Driveway account.

If you don't have a modem, you can use programs such as Flashpack to access unused portions of Flash RAM on your Palm and store data backups. This means that if your battery does run out, you can restore the data and re-establish a semi-working system quickly while travelling. The program protects your data against battery loss, but not theft or hardware damage.

If you find the built-in applications a bit cumbersome to use for travelling, there are several programs available, such as Gulliver and The Travel Organizer, that allow you to manage and plan your travel itinerary in a centralised location.

Other programs such as World Mate and Abroad have basic measurement, currency and clothing conversions for the different international standards. Abroad even allows you to download and install up-to-date currency conversions on your Palm. Both programs have multiple clock and time zone support, and general travel information about many major cities in the world.



▲ Pocket Player allows you to play standard MP3 files on your PDA.

If you're looking for very detailed information about the cities you're visiting, programs such as Citysync, Citikey and Weissmann City Profiles provide what are essentially portable travel guides. They have information on accommodation, dining, events, shopping, entertainment, culture, public holidays, climate and visas, as well as other useful information and maps in a well-organised format that is easy to access. Each city you visit needs to be installed separately, and the number of

PDA Shareware

The Travel Organizer

Manage your flight, car rental, accommodation, baggage and other travel information with this useful tool.

Abroad

This travel organiser provides currency and unit conversion, world clocks and a country information database.



Gulliver

This itinerary planner tracks hotel and rental car reservations, flight schedules, frequent flier ID numbers, airlines and airports.

Pocket Player

This is an MP3 player for Windows CE and Pocket PC PDAs.

Phoneman Pro

A mobile phone management utility, this allows you to send and receive SMS messages, manage phonebook entries, and upload logos and ring tones.

All these packages and more can be found on this month's cover CD, along with more detailed reviews.

Australian cities listed is regrettably small. There is a wide range of European, Asian and US destinations.

Finally, if you find yourself in the US, there is a comprehensive listing of free maps available for download at Mapopolis. You can choose from many vector-based maps of US cities and regions, and have detailed information in the palm of your hand.

Ronald Rosenbaum

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For a complete archive of APC PDAs columns, see apcmag.com.

APC's pointers make settling into
your new Office easy.

Switching offices

Microsoft Office 2001 for Macintosh (Office:mac) is a welcome upgrade. This month, we have some tips to help you install and configure the package. We also pay special attention to Microsoft Word and the new email and Personal Information Manager (PIM) application, Entourage.

Installation

You'd need a pretty good reason not to use Office:mac's drag-and-drop installation procedure. It's only worth doing a custom installation if you don't want to use one of the major applications.

Make sure you run the Value Pack Installer, which gives you the choice of a range of optional components. You're unlikely to want all of them (a full installation takes up over 300M of disk space), but some will probably be of interest. In most cases, the decision is easy: the Equation Editor, Analysis Toolpak, Microsoft Query and the non-English proofing tools will probably only appeal if they're relevant to your work. You'll need the programmability group if you want to create macros, but you won't necessarily need Excel's Solver add-on. Palm owners will probably want to install the Handheld Synchronization package.

The Unbinder, which extracts individual documents from an Office for Windows binder file, and the WordPerfect 5 converters are only useful if you work with such files. Leave these tools on the installation CD-ROM until you need them.

Other installation choices include assistants, fonts and templates. Many people turn this feature off (which you can now do from the Help menu). However, if you feel like a change from the animated antique Macintosh, you can install some of the alternatives. There's not much new among the extra fonts, but it's handy to have them for compatibility with documents received

from other Word users. The only unfamiliar font is Haettenschweiler (a blocky sans serif face). Try the Lucida family if you haven't already — they look better on paper than on the screen. You can install fonts individually by dragging their suitcase files from the CD-ROM onto your system folder.

There's a stack of templates in various categories, so if you prefer not to start each document from scratch, choose the groups that seem most relevant to your needs. If you use PowerPoint regularly, try the Presentation Designs category. If you do a lot of writing, the Letters-Envelopes and Writing Toolbox might be helpful. You can later discard any that are unsuitable if you need to recover some disk space.

The same goes for the clip art, which takes up nearly half the space required by the full value pack. Don't bother trying to save hard disk space by importing the catalogues and leaving the clip art on the CD-ROM, as you won't be able to browse them by category. Removing Office 98 from your system isn't mandatory, so it's worth keeping it until you are confident of getting the results you need with Office:mac. When you decide it is time to clean out the old software, use Microsoft's Remove Office tools. You can download them, along with other extras, from www.microsoft.com/mac/download/default.asp?area=O2001.

Configuration

Microsoft Word 2001 picks up many of your settings from Microsoft Word 98, but there are a few things you need to do before getting down to work. One of the most important is to reset the AutoFormat As You Type settings. If most of the text you prepare is subsequently loaded into page-layout software, it is important to avoid smart quotes and the like. Unlike Word 98 settings, most of these options are turned on by default in Word 2001.

It is very important to check your Save settings. These appear to be set to match the Word 98 settings, but take the opportunity to make sure they really are the way you like them. Open the Preferences dialog — it has been moved from the Tools menu to its more usual place in the Edit menu — and click on the Save tab. It's best to disallow fast saves or you'll end up with unnecessarily large files, and to save AutoRecover information every five or 10 minutes.

By default, the new floating formatting palette takes over from the formatting



toolbar. If you prefer the usual way of working, close the palette and choose Formatting from the Toolbars item in the View menu. If you're not working on a small screen, give the palette a try. Like those in desktop publishing and high-end graphics packages, it provides a single port of call for formatting needs, and the options available change appropriately when you are working on text or graphics.

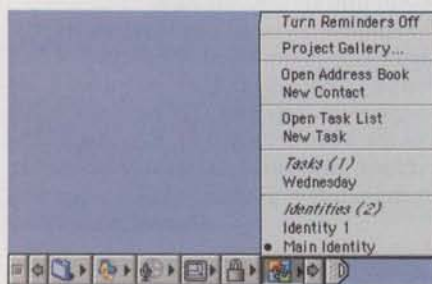
The default memory allocation for Word hasn't caused APC any problems, but people working on medium-sized Excel files report that stability improves markedly if its allocation is increased.

If your document templates are never very organised, installing a new version of Office is a good reason to tidy up. Like its predecessor, Office:mac keeps templates in the Templates folder, beside the main applications. When you save a template, the default location is the My Templates subfolder. You can create a more organised structure with a Letters-Envelopes subfolder for letter templates, and so on.

Online clip art

Using online clip art isn't quite as straightforward as it is in AppleWorks (Office:mac uses Internet Explorer as an intermediary), but it is well automated. Click the Online button in Clip Gallery. After asking for permission, Internet Explorer opens Microsoft's Clip Gallery Live Web site. You are asked to accept a licence agreement the first time you visit, but on subsequent visits you go straight to the home page (if you accepted the cookie) where you can search or browse for the images you want to use.

To download a single image, click its download icon (the red arrow pointing into



▲ QuikView provides convenient access to Entourage's PIM functions.

a small grey box, positioned just beneath the thumbnail). If you want several related images, click the checkbox below each one, then click on the Download Clips link above the top left corner of the array of thumbnails. You are then told the download size, and if you click the Download Now link, the clips will be transferred into Clip Gallery complete with keywords and categories. Downloaded clips are easy to find as they show up in Favorites, regardless of their other categorisations.

The link to the Microsoft Office Template Gallery at the top of the Clip Gallery Live home page is of limited value as it uses a Windows-specific downloading mechanism. The best you can do is copy and paste the text from the Web preview into a Word document, fix up the formatting and then save the document for future use. If you have access to a Windows system, you can download the templates and transfer them to your Mac.

Entourage

Office:mac's new email client/PIM automatically runs a setup wizard the first time it is used, taking care of the essential configuration tasks. It's worth taking a little more time to get the setup that suits you.

Entourage is compatible with the Mac OS 9 Multiple Users feature as it stores its files with a user's Documents folder. If more than one person will be using Entourage, set up Multiple Users before installing Office:mac.

Once Entourage is installed, go to the General tab in the General Preferences dialog and check that the settings match your other Office applications. Some settings to watch are 'When selecting, automatically select entire word', 'Use smart cut and paste', and 'WYSIWYG font menu'. The default measurements for printing are imperial instead of metric, and you may need to change the default reminder interval.

In the Address Book tab, none of the phone number formats match the Aus-

tralian style of (01) 2345 6789, so turn automatic formatting off. A convenient feature you may wish to enable is the automatic linking of messages to contacts.

You may also want to change the Calendar settings if you don't work nine to five.

While you're there, click the Add holidays button and import the list of Australian holidays. Don't change the 'First day of the week' setting from Sunday or the calendars may not display correctly. In Spelling, set the language to Australian English.

Turning to the Mail and News preferences, select the Read tab and disable 'Allow network access when displaying complex HTML'. Some spammers use this feature to automatically redirect you to their Web sites, while others embed a unique URL in each message they send. If your mail software accesses that link, they know your email address is active. You should consider disabling the display of complex HTML altogether; functionality is reduced, but security and privacy are improved.

If you intend to import data from your old email program or PIM, be sure to study the readme file first.

Microsoft has provided a couple of free add-ons for Entourage. Microsoft Value-Add Scripts for Entourage is really a set of three AppleScripts. They allow you to copy a contact's information to the clipboard, open a contact in Entourage, and swap a contact's home and work addresses. Even if you don't need these functions, they will help you understand how to script Entourage. The other extra is QuickView, a control strip module that provides fast and convenient access to the address book, task list and other features. If you're using the PIM features of Entourage, give QuickView a try.

Documentation

One problem with Office:mac is that there's no manual. This makes it difficult to see what's new and how to use it. You can wait



▲ Word's new formatting palette makes accessing formatting features easy.

Mac OS shareware

DiskTracker 2.0.3

This disk cataloguing and labelling program has drag-and-drop functionality.

ImageViewer 5.3.2

This program locates, displays, organises, converts and prints all graphics formats supported by QuickTime.

PrintToPDF2.1.3

Create serviceable PDF files from any application without the need for Adobe Acrobat.

SigmaChess Lite 5.1.1

A master-strength chess game, SigmaChess has database and PGN/EPD support, and ExaChess compatibility.



Stuffit Expander 6.0

A decoding and decompression utility for Mac, Expander now supports Rar files and is suitable for Mac OS X.

These programs and more can be found on this month's cover CD, along with more detailed reviews.

for someone to produce an Office:mac manual, or dig around in the help files.

The first entry in the contents list is What's New. Choose Contents and Index from the Help menu, click on What's New. These overviews of new features aren't hyperlinked to the detailed descriptions, so you have to click on the search tool, type in the name of the feature you want to find out about, then work through the most promising headings until you find what you need.

Stephen Withers

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Use your C++ skills to make a
simple craps program.

Snake eyes

Loyal readers may have noticed that this is the 24th C++ column, which makes two years of tackling simple aspects of C++. The more arcane aspects of the language have been successfully avoided, but you've probably assembled a useful set of C++ skills. This column marks a slight change of direction for Practical C++. Instead of simply discussing the features of the C++ language, we will try to put them to practical use.

This month, we begin building a game that simulates the US dice game craps (see 'Rules of the game' for an explanation of how the game is played).

The first stage in building a craps game is to build a dice class (see listings 1 and 2).

The first two lines of Dice.h (listing 1) introduce a new idea. Most projects use more than one source file and often have a header file associated with each one. The CDice class can be used in more than one place, and Dice.h is included in each of those places. If the CDice class is used as part of a bigger class, then Dice.h is included in the header file that declares that larger class.

In a complex project, it's possible that an include file might be included in a source (cpp) file more than once, potentially causing errors. To avoid this, wrap the contents of the include file in a #if/#endif pair. The first time this header file is included in a source file, `DICE_INCLUDED` will not have been defined. `#if !defined(DICE_INCLUDED)` will be true, so the entire contents of the header file will be included. However, the second line of the header file defines the macro `DICE_INCLUDED`, so subsequent attempts to include the header will find

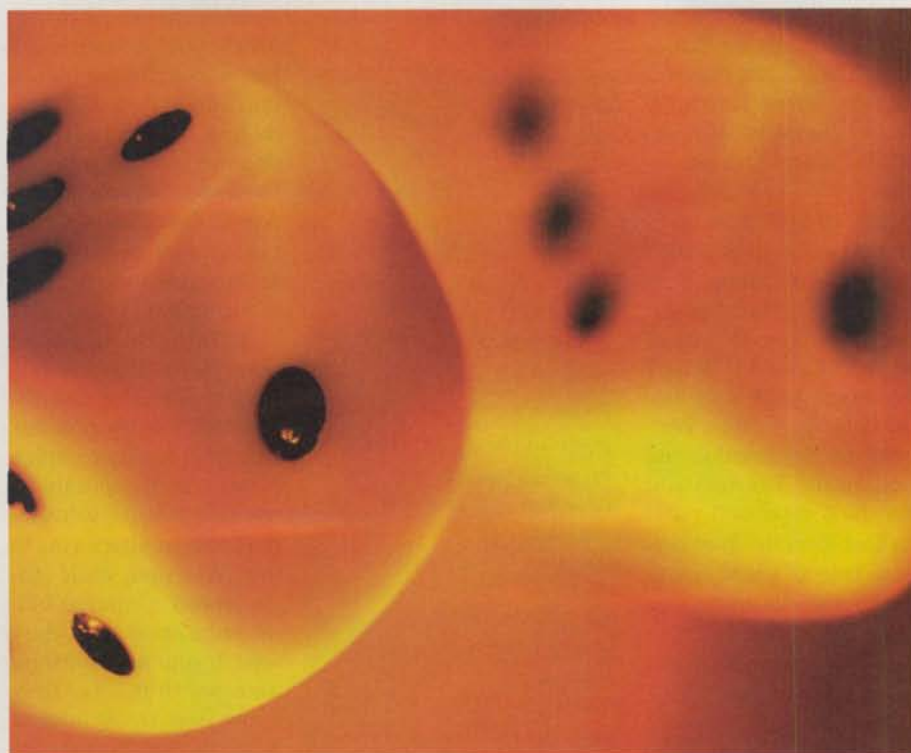
Rules of the game

In craps, a player rolls two six-sided dice until they win or lose. On each roll, the two dice are added, and the total decides the player's fate.

On the first roll, a score of seven or 11 wins, while a two, three or 12 loses.

If the player doesn't win or lose on the first roll, on subsequent rolls a score equal to the first roll wins, while a score of seven loses.

The player must continue to roll until either a win or a loss results.



the #if statement false, and will not include the contents of the header file.

The class CDice is relatively simple. It contains one data member, a constructor and one member function.

The `m_maxroll` data member indicates the maximum number that may be rolled by the dice. This is equivalent to the number of sides on the dice. Craps uses a standard six-sided dice, but by making this a variable the CDice class can be used in future games. The variable name has been prefixed with `m_` to indicate that it's a class member. This is a common convention and helps avoid confusion in the class methods about local variables and member variables.

In the constructor, there is an optional parameter to set the `m_maxroll` value. This defaults to six, the most common value, but can be manually set to any value. You can *instantiate* the class (create an instance object of class CDice) in two ways (see below).

1. CDice d
2. CDice d(8)

The first of these uses the default value of max, while the second specifies a different value. The `Roll()` member function generates a dice roll.

In listing 2 (the source file Dice.cpp), you can see the implementation of the class methods. The file includes the following three headers.

- `cstdlib`, which declares the `rand()` and `srand()` functions
- `ctime`, which declares the `time()` function
- `Dice.h`, which declares the CDice class

The `Roll()` method uses the `rand()` function, which is part of the C standard library. It produces a pseudorandom integer between 0 and `RAND_MAX`. `RAND_MAX` is typically a very large number. On Microsoft Visual C++ 6.0 and Borland C++Builder 5.0 it's 32,767, and on DJGPP 2.9.5 it's 2,147,483,647. By taking the modulus, `rand()%m_maxroll`, you get a number from 0 to `m_maxroll-1`. You then add one to get a number from 1 to `m_maxroll`.

Pseudorandom is not quite the same as random. Computers have trouble doing anything that is truly random. By using complex maths algorithms a computer can generate numbers that appear to be random. However, if you ask the computer to repeat the exercise, you get exactly the same sequence of pseudorandom numbers. The solution to this is to 'seed' the pseudorandom num-

C++ source code

Listing 1: Dice.h

```
#if !defined( DICE_INCLUDED )
#define DICE_INCLUDED
```

```
class CDice {
public:
    CDice(unsigned max=6);
    unsigned Roll();
private:
    unsigned m_maxroll;
};
```

```
#endif
```

Listing 2: Dice.cpp

```
#include <ctime>
#include <cstdlib>
#include "Dice.h"

CDice::CDice(unsigned max)
: m_maxroll(max)
{
    srand(time(NULL));
}
```

```
unsigned CDice::Roll()
{
    return 1 +
        rand()%m_maxroll;
}
```

Listing 3: Main.cpp

```
#include <iostream>
#include <iomanip>
#include <ctime>
#include "Dice.h"

using namespace std;

int main()
{
    const int ntests=10000000;
    const int nrepeats=5;
    const int maxroll=6;
    unsigned count[maxroll];
    int i, j;


    for (j=0; j<nrepeats; j++){
        time_t t=time(NULL);
        cout << "Start test "
```

```
<< j+1
        << " at "
        << ctime(&t);
        CDice d(maxroll);

        for (i=0; i<maxroll; i++)
            count[i] = 0;

        for (i=0; i<ntests; i++)
            ++count[d.Roll()-1];

        for (i=0; i<maxroll; i++)
            cout << i+1
                << "
                << setw(4)
                << count[i]
                << " ("
                << 100*count[i]/
                    ntests
                << "%)"
                << endl;
            cout << "-----" << endl;
        }
        return 0;
    }
```

 All these listings can be found on this month's cover CD.

ber series. Each pseudorandom number is generated by applying a maths formula to the previous one. By default, you always start with the same 'seed' or first number. If you provide a different seed every time you run, you get different pseudorandom numbers which appear random. How do you ensure a different seed every time? You can use the `time()` function, which returns the number of seconds since midnight of January 1, 1970. Each time you run the program, you get a different seed, and you then set that seed in the constructor using the `srand()` library function.

If you were writing a commercial gambling program, you wouldn't use `rand()` and `srand()` because a determined person could predict the random numbers and cheat on the game. However, this is a simple example program, so it's fine to use them for now.

Having produced a complete `CDice` class, you should do some testing before proceeding with the rest of the craps game. Testing a single unit of a program in isolation is known as 'unit testing'. This is a common testing technique and one that all developers should employ.

Listing 3 shows a simple unit test program to exercise your `CDice` class. The program generates a large number of dice rolls and checks to see whether they are evenly distributed. This test is repeated a number of times. If your pseudorandom number algorithm is faulty, you might see some numbers occurring more (or less) frequently than others. Our tests, using VC++ 6.0 on Windows 2000 produced an even distribution (see figure 1). A more thorough test would vary `ntests` and `maxroll` to produce a wider range of results.

It's encouraging to see that the repeats generated similar, but not identical results. If the results are identical, it could indicate that you are simply repeating the same dice rolls and that your seeding is not working properly. If you reduce `ntests` to a value where the entire test takes less than one second, the same values may be returned by `time()` and the same seed value could be used more than once.

Well, time, tide and deadlines wait for no-one, so that's all for this month. Next month, we continue with our craps application. Till then, keep on coding.

Michael Smith

```
Start test 1 at Sat Dec 16 15:18:07 2000
1 1667443 (16%)
2 1665991 (16%)
3 1666961 (16%)
4 1666242 (16%)
5 1665751 (16%)
6 1667612 (16%)
-----
Start test 2 at Sat Dec 16 15:18:10 2000
1 1664490 (16%)
2 1667169 (16%)
3 1668184 (16%)
4 1666878 (16%)
5 1667460 (16%)
6 1665819 (16%)
-----
Start test 3 at Sat Dec 16 15:18:13 2000
1 1666821 (16%)
2 1667431 (16%)
3 1667385 (16%)
4 1665625 (16%)
5 1665925 (16%)
6 1666813 (16%)
-----
Start test 4 at Sat Dec 16 15:18:16 2000
1 1667219 (16%)
2 1667171 (16%)
3 1666831 (16%)
4 1666649 (16%)
5 1666089 (16%)
6 1666041 (16%)
-----
Start test 5 at Sat Dec 16 15:18:19 2000
1 1669414 (16%)
2 1668546 (16%)
3 1665107 (16%)
4 1666322 (16%)
5 1665590 (16%)
6 1665019 (16%)
```

▲ Figure 1: Output from `CDice` testing using `Main.cpp`



For a complete archive of APC C++ columns, see apcmag.com.



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Read the data in your text files back
into a Java program.

Read something into it

Last month, we used writer classes to create and write to a text file on disk. This month, we change direction and read the data in a text file back into a Java program.

Reading text

Just as `Writer` is the base abstract class for writing character streams, `Reader` is the base abstract class for reading them. You'll find its methods listed in the table on the opposite page.

The process for reading text from a disk file is similar to the one you used to write to a disk file last month. The

`FileWriter` class was used to write a file; and the equivalent reader class, `FileReader`, will be used to read a file. You can use the base `Reader` and `Writer` class, but Java provides a number of advanced classes that add more specific functions to suit your needs — in this case, manipulating files.

To use the `FileReader` class, you must make an instance of it. This is done using the following code.

```
FileReader fr = new FileReader ("data.txt");
```

This command opens the file `data.txt` for reading.



Java source code

Note: Text that appears in italics is explanation only, not code.

Listing 1: FileViewer.java

```
import java.awt.*;
import java.awt.event.*;
import java.io.*;

public class FileViewer extends Frame implements ActionListener
{
    static public void main (String[] args) throws IOException
    {
        You need a filename to be passed in on the command line.
        if (args.length != 1)
            System.out.println ("Usage: java FileViewer [filename]");
        else
        {
            Construct a user interface.
            Frame f = new FileViewer ();
            TextArea ta = new TextArea ("", 24, 80);
            ta.setFont (new Font ("MonoSpaced", Font.PLAIN, 10));
            ta.setEditable (false);
            f.add ("Center", ta);

            Panel p = new Panel ();
            f.add ("South", p);

            Add a close button.
            Button closeBtn = new Button ("Close");
            closeBtn.addActionListener ((ActionListener) f);
            p.add (closeBtn);

            Open and read the file passed in.
            try
            {
                System.out.println ("Opening " + args[0]);
                FileReader fr = new FileReader (args[0]);
                char[] buffer = new char[4096]; Read 4K blocks at a time.
                int len;
                ta.setText (""); Clear the text area.
```

Read a batch of characters and append to the text area onscreen until you reach the end of the file.

```
while ((len = fr.read (buffer)) != -1)
{
    String s = new String (buffer, 0, len);
    ta.append (s);
}
```

Close the input stream.

```
fr.close ();
}
```

Catch any I/O errors that occur.

```
catch (IOException e)
{
    ta.setText (e.getClass().getName() + ": " + e.getMessage());
}
```

Display your form.

```
f.setSize (400, 400);
f.show ();
```

Set the title of your window and set the cursor position to the start.

```
f.setTitle (args[0]);
ta.setCaretPosition (0);
}
```

```
}
```

Handle button clicks.

```
public void actionPerformed (ActionEvent e)
{
    if (e.getActionCommand().equals ("Close"))
        System.exit (0);
}
```



This listing can be found on this month's cover CD.

A file viewing program

This month's sample program allows you to view text files on disk. Like a notepad, this program can display any text file, whether it's the data file you made last month, the Java source code or anything else.

A `TextArea` graphical component is used to display the file's text. You need to make a button that allows you to close the window when you've finished viewing your file. Do this by implementing the `ActionListener` event interface (see APC September 1999, page 159 and October 1999, page 174) and make an `actionPerformed` method that responds when the Close button is clicked.

The program requires a filename to be passed in on the command line. Then, the `FileViewer` class will open the file whose name has been passed in, and read its contents.

The method used is `read (char[] b)`, which reads a block of text into a character array `b`. The number of characters read can range from zero to the length of the array itself, depending on how many characters are available for reading. The

Methods in `java.io.Reader` Class

Name	Returns	Description
<code>close()</code>	<code>void</code>	Closes the stream
<code>mark(int readAheadLimit)</code>	<code>void</code>	Marks the present position in the stream
<code>markSupported()</code>	<code>boolean</code>	Indicates whether the stream supports the <code>mark()</code> operation
<code>read()</code>	<code>int</code>	Reads a single character
<code>read(char[] b)</code>	<code>int</code>	Reads characters into an array
<code>int read(char[] b, int o, int l)</code>	<code>abstract</code>	Reads <code>l</code> characters into array <code>b</code> , starting at offset <code>o</code>
<code>ready()</code>	<code>boolean</code>	Indicates whether the stream is ready for reading
<code>reset()</code>	<code>void</code>	Resets the stream
<code>skip(long n)</code>	<code>long</code>	Skips over <code>n</code> character

`read` method returns the number of characters that were read, or the special value `-1`, which indicates that the end of the file has been reached.

Hence, when reading the file from disk, you can continually loop around, reading from the file until you reach the end of the file. At each successful read, the contents of the `b` array are appended to the text area.

When dealing with files, there is always the possibility that something will go wrong. The filename given may not actually correspond to an existing file. The file may be corrupted and

unable to be opened. To deal with this, `IOException` errors can be caught in the program. The catch block displays an appropriate error message to the text area window.

In next month's column, we extend this program further to look at Open and Save dialogs so that you can use a menu to open and save the file being viewed. We'll also allow the text to be edited so that with a few very easy modifications the file viewing program becomes a simple text editor.

David Williams



For a complete archive of APC Java columns, see apcmag.com.



David Williams can be contacted at dave@qed.newcastle.edu.au.



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Recycling your code

Over the last eight months, Insite has explained many Active Server Pages (ASP) functions. From one month to the next, a lot of code is reused, and as you write more ASP, you'll reuse code all the time. Rather than having to retype the code every time you need it and cluttering up your pages, you can build a Visual Basic ActiveX DLL file to perform these repetitive functions automatically.

This month, you'll learn how to write a function to display dates in a format that the standard VBScript DateFormat function does not support. Rather than writing ASP code to do this 'on the page', you can embed the function in a DLL. This circumvents the need to reuse the code on every page that calls the function. Instead, you can use just a couple of lines of code to call the DLL. This is especially useful for dates coming out of Access/SQL databases, where the date is stored in American short date format.

Creating a new Visual Basic project

First, fire up Visual Basic (versions 5 or 6) and open a new ActiveX DLL from the options provided. It's a good idea to name the project before doing anything else. In the Project Explorer window, click on 'Project1', and set the name of the project in the Properties window.

The project name will become the name of the DLL when it is compiled, so name it something relevant, such as NewDateFormat. This also makes it easier to

determine its function if you revisit your ASP code. While you're at it, rename the class called Class1 to FormatTheDate as well.

Writing the date function

Now you need to build the date function. If you type Option Explicit at the top of your code, Visual Basic forces you to declare all your programming variables before using them. This might seem a little tedious, but it eliminates syntax errors due to spelling mistakes.

When you declare your function, choose a name that

is relevant to what you want it to do. That way, when you call the function from your ASP code it is easier to read and understand. You also need to declare the incoming and returning data types in the function declaration.

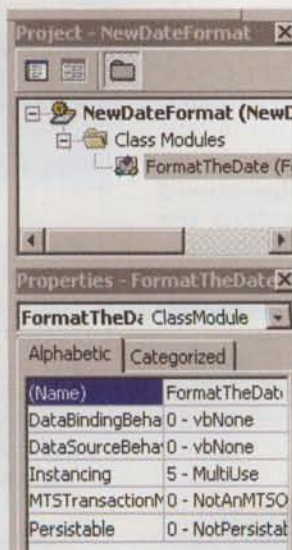
Use the variant data type for these because, unlike many other languages, Visual Basic has no data type specifically for dates. The function declaration will look like the following.

Function FormatTheDate(OldDate as Variant)
As Variant

The incoming data variable is called OldDate, with the data type variant. The As Variant on the end sets the return data type — that which will be sent back to the ASP. The function name is also used for the return data variable name.

If you are concerned about having to learn Visual Basic, don't worry. ASP uses VBScript, which is derived from the native Visual Basic language. Consequently, you can cut and paste most ASP code into a Visual Basic project without the need for much tweaking.

Build custom ActiveX controls with Visual Basic and use them in your ASP pages.



▲ Figure 2: Naming the Visual Basic project and class

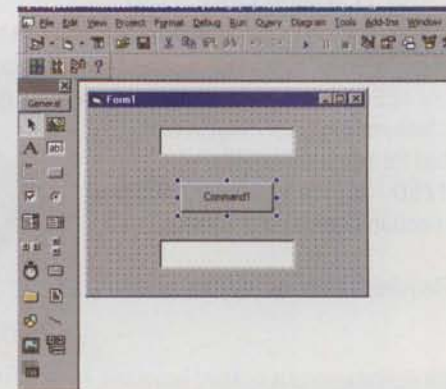
In our example, the incoming date is broken down into its day, month and year components before being reassembled into the date format required. Finally, the return variable (which has the same name as the function itself) is set to equal the newly formatted date. The complete code for the class is shown in listing 1. When you save the project, make sure you also save the class file in the same directory.

Testing the DLL

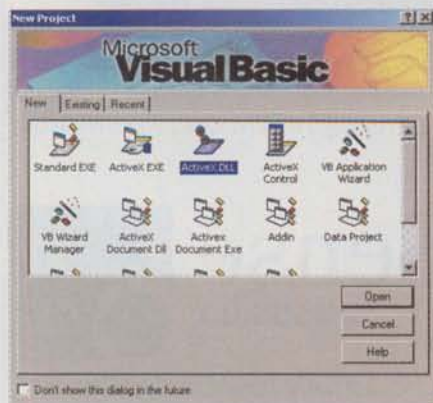
The one drawback with DLLs is that they are difficult to modify once they are registered on the server. For this reason, it's a good idea to test them before you compile and install them. An easy way to do this is to write a simple program in Visual Basic that incorporates the DLL.

Now you can add the class you made in your DLL to the new project. In the Project Explorer window, right-click on 'Project1(project1)' and select 'add — class module'. Find the class you saved from the DLL (in the 'existing' tab) and open it. Go back to the form and double-click on the command button to create the subroutine for the on-click event.

The only unusual piece of code you need creates an instance of the FormatTheDate class on the form and gives it a name. The code for this is written as follows.



▲ Figure 3: The Visual Basic testing project



▲ Figure 1: Creating a new ActiveX DLL project in Visual Basic

Dim NewFormat As New FormatTheDate

A line of code is also needed to take the input from the first text box and display the formatted output in the second text box. When your code looks like that in listing 2, your form is ready to test the DLL class.

Run the project, enter a date in the first text box (for example, 21/10/00), and then click on the form button. The newly formatted date should appear in the second text box. If it's not in the correct format, stop the program and modify the class until you get the desired output. Save and close the form project, and open up the DLL project again.

Compiling and registering the DLL

To compile the DLL, select File from the menu bar, then click on Make NewDateFormat.dll. The Visual Basic compiler spits out any syntax errors in your code, so fix any faults it finds, then recompile. Save your new DLL somewhere for safekeeping.

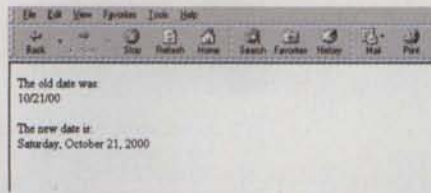
Before you can use the new DLL in any ASP pages, it needs to be installed and registered on your Web server. Copy the DLL into the C:\WINNT\system32 folder (for Windows NT) or C:\Windows\System folder (for Windows 95/98) on your Web server. To register the new object, open the Windows Start menu, select Run, and type regsvr32 NewDateFormat.dll. You should get a Windows dialog box like that in figure 4. If you don't, make sure the new DLL has been copied to the right folder. The new object is now ready to be used on any Web page run from the server.

Writing the ASP code

The first thing to do before using the new date DLL on your ASP page is create



▲ Figure 4: A successful DLL registration



▲ Figure 5: HTML generated by the ASP using the DLL

an instance of the DLL object. This is done in the same way as other standard VBScript objects, such as the FileSystemObject. Use the DLL name and the class name and assign it to a variable, as shown below.

```
Set objDate=Server.CreateObject("NewDateFormat.FormatTheDate")
```

You now have an instance of the object called objDate that can be called anywhere on the page. To call the function in the object, refer to it by the function name and pass it the date you want reformatted. Then assign the return value to a variable, in this case newDate. All this can be done on one line, as shown below.

```
newDate=objDate.ReformatTheDate(date)
```

This code uses standard object.method programming functions. The instance of the DLL is the object, and the function in the DLL is the method. This means you can have multiple functions in your DLL, and access them separately by calling different methods. If you now display the newDate variable, you will see your newly

formatted date, as shown in figure 5. The code used to generate this result is shown in listing 4.

Using multiple formatting options

You now have a DLL that converts dates into a single, preferred format. If you want to add other formatting options, you can write multiple DLLs, but a more elegant solution is to use the same function and pass another parameter into it to tell it what format you want to return.

Open a new ActiveX DLL project, rename it 'project(MultipleDateFormat)'

and rename the class 'class(DateFormat)'. As this function is designed to handle two incoming parameters, its definition will appear as follows.

```
Function ReformatTheDate(oldDate As String, FormatType As Integer) As Variant
```

Make sure to give the project and class different names from the ones you used in your last project. Visual Basic allows you to import classes into projects to save rewriting, so if you have classes with the same name, problems will occur when compiling. The code for this new class is shown in listing 3.

A simple If...Then...Else statement is used to test the FormatType variable before setting the return variable. In each case, a variable with the same name as the function is used for the newly formatted date. If the DLL gets to the end of the statement block and hasn't matched a parameter type, then the return variable is set to 'Format not found. Please check parameter.'

When your code looks like that in listing 3, compile, save and register the new DLL the same way as you did the first DLL. Now, when you call the function from an ASP page, you need to pass the date to be formatted, as well as a number to indicate the format style of the date to be returned (for example, 1, 2 or 3). The ASP code will look like the following.

```
newDate=objDate.ReformatTheDate(date,3)
```

Security

These components don't create any security risks or browser problems for your Web visitors. This is because the DLLs are executed on the server and not in the browser. They don't introduce any security problems for your site or server either. Of course, it's possible to write DLLs that interact with server files and permissions, but they inherit the associated security issues. However, the date formatting objects described here just pass variables to and from Web pages, and therefore carry relatively few risks.

These are just two very basic examples of how ASP pages can use custom ActiveX objects to perform repetitive or sensitive server tasks. They demonstrate how compact ASP code can become, and how you can avoid reusing code on more than one server page.

Sean Goodwin

Insite source code

Note: Text that appears in *italics* is explanation only, not code.

Listing 1: The Visual Basic class code

```
Option Explicit
Dim theMonth As Variant
Dim theDate As Variant
Dim theDateName As Variant
Dim theYear As Variant
Dim theNewDate As Variant
```

```
Function ReformatTheDate(OldDate As Variant) As Variant
```

This function takes a standard American mm/dd/yy date and reformats it into a custom long date format (eg. Saturday, October 21, 2000).

Break down the incoming date into its day, date, month and year components.

```
theMonth = MonthName(Month(OldDate))
theDate = Day(OldDate)
theDateName = WeekdayName(Weekday(Day(OldDate)))
theYear = Year(OldDate)
```

Reassemble the pieces in the order you want to display them, ensuring you include any punctuation and spaces.

```
theNewDate = theDateName & ", " & theMonth & " " _
              & theDate & ", " & theYear
```

Finally, set the return string to equal the newly created date string.

```
ReformatTheDate = theNewDate
```

```
End Function
```

Listing 2: The Visual Basic code for testing the class

```
Private Sub Command1_Click()
    Dim NewFormat As New FormatTheDate
    Text2.Text = NewFormat.ReformatTheDate(Text1.Text)
End Sub
```

Listing 3: Using a single function to return multiple formatting options

```
Option Explicit
Dim theMonth As Variant
Dim theDate As Variant
Dim theDateName As Variant
Dim theYear As Variant
Dim theNewDate As Variant
Dim ps As String
```

```
Function ReformatTheDate(OldDate As Variant, _
    FormatType As Integer) As Variant
```

Break down the incoming date into its day, date, month and year components.

```
theMonth = MonthName(Month(OldDate))
theDate = Day(OldDate)
theDateName = WeekdayName(Weekday(Day(OldDate)))
theYear = Year(OldDate)
```

Depending on the number passed into the FormatType variable, assemble the new date in different formats.

```
If FormatType = 1 Then
```

Output looks like Saturday, October 21, 2000.

```
theNewDate = theDateName & ", " & theMonth & " " _
              & theDate & ", " & theYear
ReformatTheDate = theNewDate
```

```
Elseif FormatType = 2 Then
```

Output looks like October 21, 2000.

```
theNewDate = theMonth & " " & theDate & ", " & theYear
ReformatTheDate = theNewDate
```

```
Elseif FormatType = 3 Then
```

Insert your own format — see CD for code of other options.

```
Else
```

```
ReformatTheDate = "No format found. Check parameter type."
```

```
End If
```

```
End Function
```

Listing 4: Using a single function to return multiple formatting options

```
<%@ language=VBScript%>
```

```
<%
```

```
' set a variable to a date to test
```

```
oldDate="10/21/00"
```

Call the server object and create an instance of it.

```
Set objDate=Server.CreateObject("NewDateFormat.FormatTheDate")
```

Pass the old date variable to the object, and return a result to newDate.

```
newDate=objDate.ReformatTheDate(oldDate)
```

Display the results.

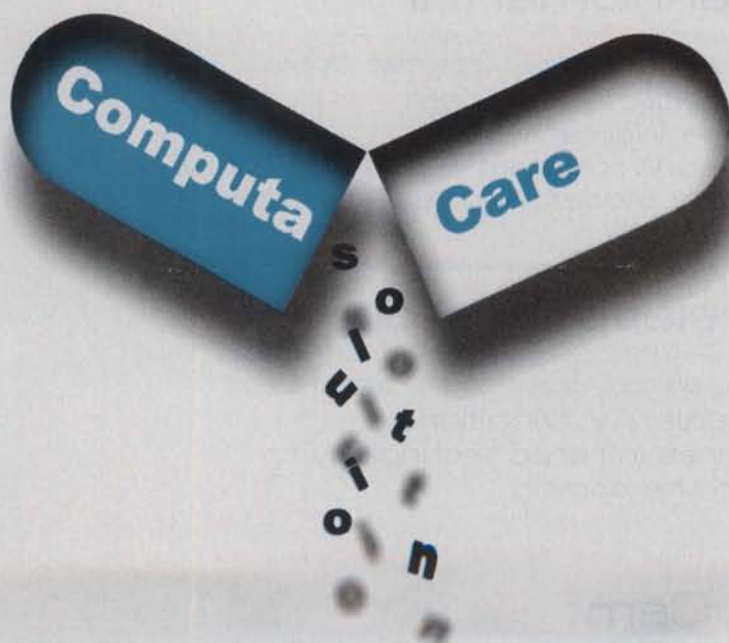
```
Response.Write("The old date was: <BR>")
Response.Write(oldDate)
Response.Write("<BR><BR>")
Response.Write("The new date is: <BR>")
Response.Write(newDate)
```

```
%>
```



For the complete code for all the pages used here, check this month's cover CD.

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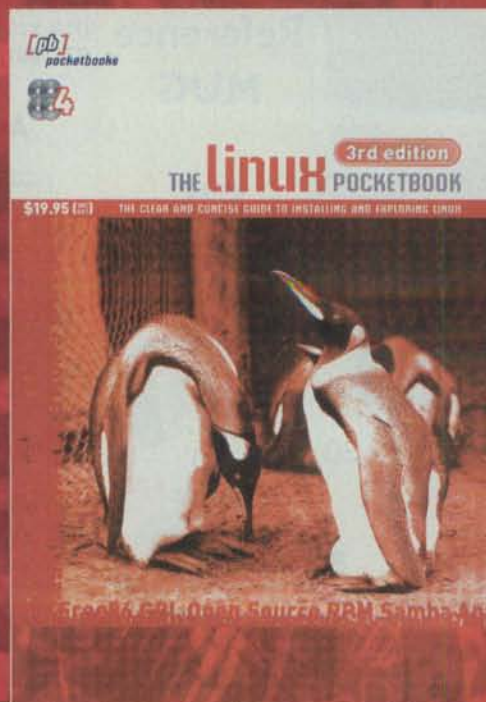
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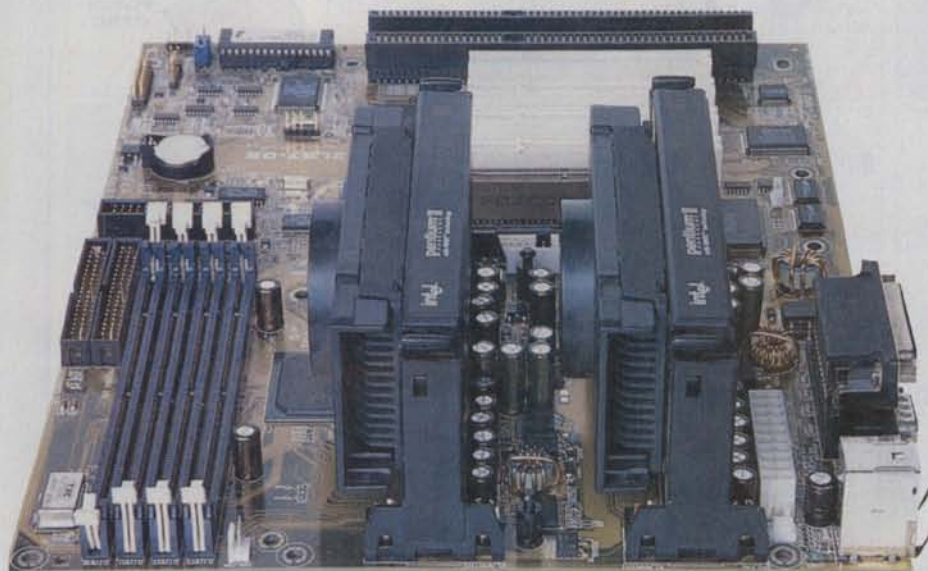
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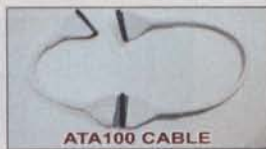
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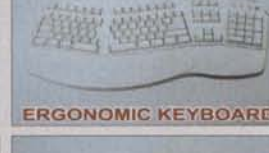
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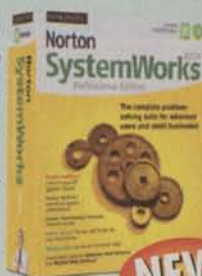
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EPSON Stylus Colour 200/300/400/500/600/800/850/1520	12	33A-BKL
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	12	33B-BKL
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	12	35A-BKL
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CANON BJC-3000/6000/8000 Series	3x8	47-CLR
HP Colour Desk Jet 300/400/500 Series & Olivetti	3x12	14A-CLR
HP Colour Desk Jet 600C/660C/690C Series	3x12	14B-CLR
HP Desk Jet 850C/855C/870C/1000C Series	3x3	30A-CLR
HP Desk Jet 710/720/890/900 Series	3x3	30B-CLR
EPSON Stylus Colour /PRO/XL	3x4	16-CLR
EPSON Stylus 820/colour II/III	3x12	24-CLR
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	3x12	34B-CLR
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	3x6	36A-CLR
IBM/LEXMARK 5000/5700/7000 & Z Series	3x6	36B-CLR
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HP PHOTOSMART Star & Moon combined
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Canon BC-01, BC-02, BJC-210
Canon BC-03, BC-3X (fax) BJC-210sp, 245, 255, 265
Canon BC-06 photo
Canon BJ-300, 330
Canon BJC-600, 610, 620
Canon BJC-800, 820, 880
Canon BJC-2000 BC-20, BCI-21, BCI-21C
Canon BJC-4000, 4100, 4200, 4300, 4550, 5000, 5500 BCI-21
Canon BJC-4000, 4100, 4200, 4300, 4550, 5000, 5500 BC-20
Canon BJC-5000/ 5500 (BC-23 only)
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Canon BJC-6000 (BC-32 PHOTO)
Canon BJC 7000, 7100 BC-60, BC-61
Canon BJC 7000, 7100 photo BC-62
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K2BK	6/9	K10CLR	12
K3BK	6	K22CLR	6
K3BK	6	K11CLR	6
K1BK	6/9	K9CLR	12
		K25CLR	6
K7BK	60	K1CLR	30
K8BK	7	K2CLR	12
K4BK	9	K2CLR	12
		K23CLR	6
K9BK	7		
K10BK	16	K3CLR	8
K11BK	12	K4CLR	4
K12BK	9/60	K5CLR	30
K12BK	60	K5CLR	30
K12BK	9	K5CLR	30
K27BK	9	K5CLR	30
K28BK	12	K35CLR	6
		K36CLR	6
K19BK	2	K24CLR	6
		K15CLR	6
K13BK	12	K20CLR	6/12
K16BK	12	K7CLR	6/12
K14BK	12	K6CLR	12
K15BK	8	K6CLR	6
K17BK	12	K20CLR	6/12
K17BK	12	K8CLR	6
K17BK	12	K17CLR	6/12
K21BK	3	K34CLR	3
K26BK	12	K19CLR	6/12
K6BK	12	K16CLR	6/12
K6BK	12	K35CLR	6
		K33CLR	9/12
K18BK	6	K13CLR	12
K24BK	6	K13CLR	12
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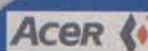
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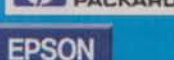
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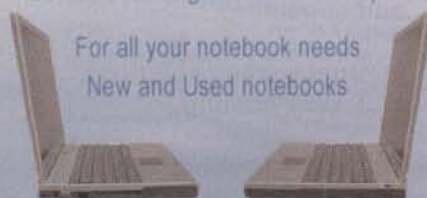
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CANON BJC600/610/620	15	C5
CANON BJC4000/4100/4200/4550 BCI-21/20	50/8	C8
CANON BJC 3000/6000	4	C19
CANON BJC 7000	6	C15
HP DESKJET 400, 500 & 600 SERIES	7	H2/H4
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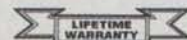
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\$5,299

*SS = Speed Step



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Compare Tecra 8100 Models

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	Tecra 8100	Tecra 8100	Tecra 8100	Tecra 8100
Processor	Pentium III 600MHzSS*	Pentium III 700MHzSS*	Pentium III 750MHzSS*	Pentium III 850MHzSS*
RAM Std/Max	64 MB	128 MB	128 MB	128 MB
Hard Disk	12GB	12GB	20GB	20GB
Screen	14.1" TFT	14.1" TFT	14.1" TFT	14.1" TFT
CD-ROM	24x CD-ROM	24x CD-ROM	No	No
Mic & Spkr	Speakers	Speakers	Speakers	Speakers
Port replicator	Optional	Optional	Optional	Optional
Select bay	Yes	Yes	Yes	Yes
DVD capable	6 x DVD	6 x DVD	6 x DVD	6 x DVD
Weight	2.8 kg	2.8 kg	2.8 kg	2.8 kg
Warranty	3 Years	3 Years	3 Years	3 Years
56K V.90 modem	Yes	Yes	Yes	Yes
RENT*	\$48.30	\$63.58	\$63.85	\$69.15
GST INC	\$5,299 ##	\$7,328 ##	\$7,328 ##	\$7,970 ##
With Windows 95/98	(94185)	(A2868)	(A2863)	(B0084)
RENT*	\$50.12	\$59.85	\$65.32	\$70.41
GST INC	\$5,499 ##	\$6,898 ##	\$7,529 ##	\$8,115 ##
With Windows 2000/NT4	(94186)	(A2869)	(A2864)	(B0085)

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Finance methods are subject to approval.

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Compare Ultra Portable Porteges

	Portégé 3480CT	Portégé 7220CTe
Processor	PIII 600MHz	PIII 650MHz
RAM Std/Max	64/192 MB	64/192 MB
Hard Disk	12GB	12GB
Screen	11.3" TFT	13.3" TFT
Display	1024x768	1024x768
CD-ROM	Optional	Optional
Mic & Spkr	Yes	Yes
Port replicator	Optional	Optional
Select bay	No	No
LAN	Yes	Optional
DVD capable	Yes	Yes
Weight	1.6 kg	2 kg
Warranty	3 Years	3 Years
56K V.90 modem	Yes	Yes
RENT*	\$45.65	\$54.43
GST INC With Windows 95/98	\$4,885 (A5779)	\$5,972 (A2839)
RENT*		\$54.82
GST INC Windows 2000/NT4	(N/A)	\$6,015 (A7020)

Portégé 3480CT

The Portégé® 3480CT is the ultimate statement in mobile computing with its Pentium® III power, large high resolution colour display, long battery life and easy functionality all packed into an ultra thin lightweight body finished in sleek magnesium.



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*SS = Speed Step

Toshiba Install Options

For a small extra charge we can install your chosen options into your new Toshiba eg: more memory. Call for more information.

TOSHIBA Battery Packs

For Satellite 4000/4010/2520CDT & others (21930) GST INC

\$118

For Portégé 3010/3020 (Lithium Ion)

(73665) GST INC

\$120

For Satellite 4000 Series (72109) GST INC

\$118

For Tecra 8000 (Lithium Ion) (29358) GST INC

\$237

TOSHIBA High Capacity Battery Packs

For Portégé 3010/3020

(72475) GST INC

\$237

For Portégé 7000/7020

(66479) GST INC

\$328

TOSHIBA Battery Charger

For Tecra 8000 (29357) GST INC

\$209

TOSHIBA Universal AC Adapter

For Tecra 8000/ Satellite 4000/4010 & others (44200) GST INC

\$104

Blue Tooth

Toshiba Brings First Bluetooth PC Card Solution to Market

Toshiba's wireless solution empowers portable computer users to unplug from the restraints of

conventional wired computing

with a fully integrated Bluetooth

PC Card, complete with SPANworks productivity software.

Using short-range wireless radio

communication, Bluetooth technology

facilitates fast and secure transmission of both voice and data at speeds of up to 1 Mbit/s, which is up to 20 times faster than a standard V.90 modem

connection. Utilising this revolutionary wireless technology, Toshiba's Bluetooth PC Card can be used to connect portable computers, printers, digital mobile phones, PDAs, digital cameras, network access points and other mobile devices to one another and connect to the Internet or a LAN without the need for wires or cables. Many of these products will be available by calendar Q1 2001.



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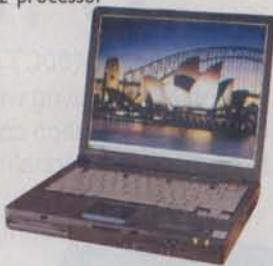
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Freedom to Think

ARMADA E500

Value, expandability and performance! The Armada E500 notebook provides the all-in-one solution that will meet your individual needs.

- Intel Mobile Pentium III 700MHz processor
- 15" Colour TFT XGA Display
- 64MB SDRAM
- 12GB Hard Disk Drive
- 4X DVD-ROM
- Integrated Modem and 10/100 Ethernet
- Windows 95/98 Dual Install
- 48-hour service workshop turnaround repair time



ARMADA M700

For exceptional performance in a thin and light form factor, the Armada M700 notebook has all the power you need.

- Intel Mobile Pentium III 750MHz processor
- 14.1" Colour TFT XGA Display
- 128MB SDRAM
- 12GB Hard Disk Drive
- 8X DVD-ROM Drive
- Integrated Modem and 10/100 Ethernet
- Microsoft Windows NT/2000 dual install
- 3 year pick-up warranty with 48-hour service workshop turnaround repair time



RENTSMART

\$5,259 inc GST (A4116)

RentSmart
\$47.93 / week

\$6,790 inc GST (A4236)

RentSmart
\$58.91 / week

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iPAQ POCKET PC H3130 MONO

Affordable technology that enables users to store business critical information when they need it most.

- 206MHz Intel StrongARM 32-bit RISC processor
- Display 59.6mm wide x 78.8mm tall
- 15 gray-scale STN LCD touch screen
- 16MB RAM, 16MB Flash ROM
- Handwriting recognition, soft keyboard, voice recorder, inking
- 950 mAh Lithium polymer battery, up to 14 hours
- 163.5 grams, including battery



\$875 Inc GST (B4505)

RentSmart
\$9.59 / week

iPAQ POCKET PC H3630 COLOUR

First class technology that enables users to store business critical information when they need it most.

- 206MHz Intel StrongARM 32-bit RISC processor
- Display 59.6mm wide x 78.8mm tall
- Super bright 12-bit TFT display with 4,096 colours and reflective technology
- 32MB RAM, 16MB Flash ROM
- Handwriting recognition, soft keyboard, voice recorder, inking
- 950 mAh Lithium Polymer with up to 10-hour battery life
- 170 grams, including battery



\$1,149 Inc GST (A3737)

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\$12.59 / week

MPI400 MICROPORTABLE PROJECTOR

- Native SVGA (800x600) display
- Plug & Play features, AutoSync technology
- Displays video from a VGA or DFP source
- Optional multimedia adapter with Premier Sound speaker and remote control
- Texas Instruments Digital Light Processing (DLP) technology
- Two-year world-wide limited warranty



\$5,965 inc GST (A5430)

RentSmart
\$54.37 / week

MPI800 MICROPORTABLE PROJECTOR

- Native XGA (1024x768) display
- Plug & Play features, AutoSync technology
- Displays video from a VGA or DFP source
- Full featured remote control with remote mouse and laser pointer
- 8-watt Premier Sound speaker system included in multimedia adapter
- Texas Instruments Digital Light Processing (DLP) technology
- Two-year world-wide limited warranty



\$9,223 inc GST (B2973)

RentSmart
\$78.75 / week

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- Compaq Carbon Scroll Mouse and Internet Keyboard
- 15" Carbon Colour CRT Monitor

NEOSERVER 150

This is an all-in-one, ready to go server. It provides a growing business with a quick, easy and cost-effective network.

- No additional operating system required
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- Shared internet and local e-mail access
- Internal company website
- Built-in secure firewall
- Supports up to 100 users

AMT	MODEL	PART #	COST	SUB-TOTAL
1x	NeoServer 150	A0268	\$2,669	\$2,669
5x	iPAQ with keyboard	A2345	\$1,095	\$5,475
5x	S510 Monitor	A6307	\$369	\$1,845

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15.1"
LCD Flat
Screen
Monitor
(A8436)
GST Inc

\$1,640



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800MHz Duron Family Pack

COMPUCON

- AMD Duron 800Mhz Socket A Cpu with 192K cache
- 128MB PC133 SDRAM, 8ns
- 20.4GB HDD
- Leadtek S325 AGP 32MB Riva TNT2 Nvidia M64 Video Card
- Compucon 3401 Micro ATX Case
- 1.44MB Floppy Drive
- Internal 32/8X/4X IDE CD-RW
- Compucon PS2 Internet Keyboard
- Compucon PS/2 Scroll Button Mouse

- Compucon 17" Multimedia Monitor
- 64 Bit PCI 3D Audio On Board
- Subwoofer SW-500
- 3 Years On-Site Warranty
- Microsoft Windows Millennium Edition

- Lotus Smartsuite ME
- McAfee Antivirus
- Netcomm 56K Fax/Modem Internal

Rent 3 Yrs** **\$26.47** (B4520) GST Inc

\$2,699*



This system
includes the Epson
Stylus 480 Colour
Printer and VuegoScan
640P flatbed scanner.



667MHz Atlantis PC

COMPUCON

- Intel Celeron 667Mhz with 128K Cache
- Socket FC-PGA Motherboard, VIA 694, 133Mhz FSB
- 2 x Serial, Parallel, PS/2 keyboard and mouse, 2 x USB Ports
- 64MB PC133 SDRAM
- 10.2GB Ultra ATA 100 5400 RPM Hard Drive
- 4MB AGP Graphics Card
- Compucon Super Mid-Tower Case
- 1.44MB Floppy Drive
- Compucon Windows 95 PS/2 Keyboard
- Compucon PS2 Scroll Mouse
- Integrated Sound Blaster/ Direct Sound AC97 Audio
- 10/100 MB PCI Network Card
- Windows ME
- 3 Years On-Site Warranty
- 5 PCI, 1 ISA, 1 AMR and 1 AGP 4X slots, 3 DIMMs

Rent 3 Yrs** **\$16.66** (B4174) GST Inc

\$1,520*

* Monitor Not included



This system with 15" Compucon
Multimedia Monitor:

Rent 3 Yrs** **\$20.16** GST Inc:

\$1,840

Monitor price is (25874)

GST Inc **\$320**

667MHz Isis MiniStation

COMPUCON

- Intel Celeron 667Mhz CPU with 128K Cache
- Intel 810e Chipset Motherboard, 133Mhz FSB
- 64MB PC133 SDRAM
- 10.2GB Ultra IDE 66 Hard Drive
- 1 x Serial, Parallel, PS/2 keyboard and mouse, 2 x USB Ports
- GMCH Video with 4Mb SDRAM display cache
- Compucon Slim-line LPX Case with 90W PS
- (Dimensions of 78mm x 300mm x 320mm)
- 1.44MB Floppy Drive
- Compucon Windows 95 PS/2 Keyboard
- Compucon PS/2 Scroll Mouse
- Intel 10/100 Network Card + Wake-On-Lan
- Integrated in ICH Software audio
- Windows 95 or 98 on CD
- 3 Years On-Site Warranty
- (2 PCI, 1 AMR, 1 PTI-on riser, 2 DIMM slots)

Rent 3 Yrs** **\$17.42** (B3090) GST Inc

\$1,590*

* Monitor not included



This system with 15.1"
LCD Flat Screen Monitor:

Rent 3 Yrs** **\$31.67** GST Inc:

\$3,230

Monitor price is (A8436)

GST Inc **\$1,640**

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Compucon Centaur — Pentium 4 Power

GST Inc

\$5,199

(B2473*)

Rent for \$47.39 per week
over 3 years



- ☒ Compucon 1.4GHz
- ☒ Intel Pentium 4 CPU
- ☒ 128Mb RAM
- ☒ 30Gb Hard Drive
- ☒ 16xDVD
- ☒ 32Mb SDRAM Graphics Card
- ☒ Windows ME

GST Inc

\$6,436

(B2584*)

Rent for \$58.66 per week
over 3 years



- ☒ Compucon 1.5GHz
- ☒ Intel Pentium 4 CPU
- ☒ 128Mb RAM
- ☒ 45Gb Hard Drive
- ☒ 16xDVD
- ☒ 32Mb SGRAM Graphics Card
- ☒ Windows ME

*Monitor not included



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Pentium 4 Centaur (B2473*) COMPUCON

- Intel Pentium 4 - 1.4Ghz CPU
- Intel D850GB Motherboard, i850 chipset
- 128MB RDRAM (Rambus)
- 30GB Hard Drive, 7200RPM
- Compucon Centaur Tower Case
- 1.44 MB Floppy Drive
- Compucon Internet Keyboard
- Compucon Scroll Mouse
- SoundBlaster 128 Sound Card
- Intel 10/100 Network Card
- Windows ME on CD, Microsoft Encarta
- Microsoft Games Pack

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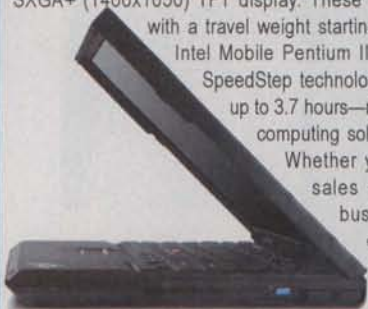
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Protected by Titanium Composite covers, ThinkPad T Series notebooks are the lightest, high performance mobile computers with up to a 14.1" SXGA+ (1400x1050) TFT display. These notebooks are 3.3cm trim with a travel weight starting at 2.1kg, powered by an Intel Mobile Pentium III processor featuring Intel SpeedStep technology, and a battery that lasts up to 3.7 hours—making them an ideal mobile computing solution for frequent travelers.



Whether you are on your way to a sales call across town or a business meeting across the continent, the ThinkPad T Series notebooks deliver a better e-xperience.

Model Number:	26472BA - ThinkPad T21
Processor type:	Mobile Pentium III 750MHz
Memory - stand / max:	128 MB / 512 MB
Disk capacity:	10GB
Display:	13.3" 1024x768 - TFT - active matrix
PCMCIA support:	2 Type I/II or 1 Type III
CD-ROM:	24Xmax-10Xmin
Audio:	Crystal Semiconductor CS4624/CS4297a
Fax/modem speeds:	56K (V.90 Comp.) Integrated with 10/100 ethernet
Operating system:	Microsoft Windows 98 Second Edition
Rent TAP*	\$53.77
Part No	(A9624)
GST INC	\$5,899

Meet your needs without compromising your budget - You can trust the proven technology of the NetVista A20 desktop, including a choice of Intel processors up to 733MHz and integrated graphics. Choose powerful, proven technology with world-renowned IBM service and support - Plus, it's backed by IBM, with a three-year, limited warranty. Simplify your computing experience with unparalleled ease of use - Access IBM allows you to click your way directly to service and support, system updates and diagnostics and shopping for options or upgrades. It's easy to expand, with three slots, four bays and five ports, including two plug-and-play USB ports. It's easy to service, too—with a new, easy-access mechanical design. Finally, NetVista A20 is easy to manage and secure, supporting IBM Universal Manageability tools and Client Security Solutions.



* Monitor not included

NetVista A20

Model Number:	6266M3A - NetVista A20
Form factor:	Small Form Factor (3x3)
Configuration type:	Small Form Factor (3x3), PCI
Processor type:	Pentium III 733MHz
No of processors std/max:	1/1
Memory - std / max:	64MB/512MB
Disk capacity:	10GB (Ultra ATA)
Fax/modem speeds:	
Graphics subsystem:	Intel 810e, Dynamic (DVMT)MB and AGP 2x
Slots & bays (total/avail):	2(1) x 3(0)
CD-ROM:	48Xmax-20Xmin
Audio:	Intel integrated
Network interface:	Ethernet
Operating system:	Microsoft Windows 98 Second Edition
Rent TAP*	\$18.51
Part No	(B3119)
GST INC	\$1,689

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Model Number:	847842X
Level II Cache:	256KB/256KB
Processor:	PIII 800MHz
RAM stand/max:	128/1500MB
HDD:	9.1GB
HDD type:	Ultra 160 SCSI
Network interface:	Ethernet Integrated
CD-ROM:	40x max- 20x min
Rent TAP*	\$30.84
Part No	(B1092)
GST INC	\$3,145

@server xSeries 200

If your business is at the point where you need a server, but don't have a big budget, the IBM e server is the affordable solution. Packed with power and scalability features that support file-and-print serving, workgroup productivity applications and shared Internet access, the IBM e server is the reliable network foundation you need.



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Desktops, Notebooks & Servers

Acer Veriton FP2

Specifically aimed at professionals seeking high-level performance without the look and feel of the traditional PC, the Veriton FP2 Series reveals a space-saving design that revolutionises the look of the traditional office work desk. Standard with 15" TFT LCD monitor.

MODEL	VERITON FP2
15" MONITOR	Veriton FP2 All-In-One
CPU	PIII800
RAM / HDD	128/20GB
CD / LAN	24X CD / LAN / FAX
VIDEO	Geforce2 MX 32MB
MONITOR	15" TFT LCD
MULTIMEDIA	32-bit sound / speakers
OP. SYSTEM	Windows ME
Part #	(B4512)
Rental	\$48.20
GST Inc	\$5,288

Acer Power Sx

The AcerPower Sx has the winning combination for small businesses. All AcerPower Sx Series models include speakers, microtower housing, and come standard with a 15" V551 monitor, as well as the following software: Lotus SmartSuite, Quicken QuickBooks, PC-Cillin Anti-Virus.

MODEL	ACERPOWER SX	ACERPOWER SX
CPU	c633	PIII866
RAM	64MB	64MB
HDD	10GB	10GB
CD / LAN	50X / 10/100	50X / 10/100
VIDEO	Integrated UMA 8MB	Integrated UMA 8MB
OP. SYSTEM	Win98	Win98
Part #	(B4513)	(B4514)
Rental	\$20.45	\$22.92
GST Inc	\$1,866	\$2,337

Acer V771 17" Monitor upgrade
Approx **\$135** extra - just ask when placing your order!

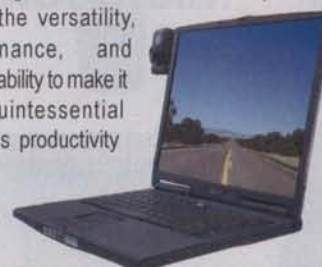


Acer TravelMate

MODEL	350TE	521iT	524TXV
SCREEN	13.3" TFT	12.1" TFT	14.1" TFT
CPU	PIII 650 SpeedStep	Celeron 600	PIII 650 SpeedStep
RAM	64 MB	64 MB	64 MB
HDD	10 GB	5 GB	12 GB
GRAPHICS	8 MB	8 MB	8 MB
CD ROM	24 X CD	24 X CD	NO
DVD	NO	NO	6 X DVD
FAX/MODEM	56Kbps	56Kbps	56Kbps
OTHER	10/100 LAN	10/100 LAN	10/100 LAN
OP. SYSTEM	Windows ME	Windows 98	Windows ME
Part #	(B3080)	(B1708)	(B3411)
Rental	\$48.30	\$30.68	\$45.26
GST Inc	\$5,299	\$3,129	\$4,966

The TravelMate 350 offers unique integrated Smart Card technology to enable users to conduct secure online transactions, including online banking and shopping. The Smart Card also enables users to lock their systems against unauthorised access and supports encryption and decryption of files stored in the system.

The TravelMate 520 series all-in-one business portable heralds the arrival of a new business-computing era. Acer's latest all-in-one portable offers the versatility, performance, and dependability to make it the quintessential business productivity tool.



Pentium III available in some Acer Systems such as the Veriton FP2 (pictured) **\$Call** for details



Altos SA50 File Server

The Acer Altos SA50 is a server appliance, providing many of the features available on regular servers in one slim box. The server appliance can best be defined as a network-enabled device designed to provide a single dedicated service, such as email, file/print sharing, internet access or as a predefined suite of services. The SA50 is a non-programmable, pre-configured system designed for easy deployment and minimal cost of ownership.

MODEL	SA50
PROCESSOR	c566
RAM STD/MAX	64 MB / 256 MB
HDD	15 GB
PORTS	1 x serial, 1 x parallel, 3 x PCI
NETWORK CONTROL.	Integ. UltraDMA/66 IDE
MONITOR	NO
MODEM	56k v.90 External
OP. SYSTEM	Linux
Part #	(A9219)
Rental	\$23.00
GST Inc	\$2,099

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Removable, generously proportioned hard disk drive for all user needs.



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Lockable USB, serial, parallel, PS/2 and LAN ports to fit your computing environment.



Media Choice

Fast, slim CD and media-free models.



Power

Powerful Intel Pentium III and Celeron processor configurations and generous RAM to suit any business application.



Operating Systems

Choose from a range of Microsoft operating systems including Windows 2000 to match your corporate standard.



e-Diagnostics

The intelligent eDiagTools technology allows instant problem identification and web-enabled notification to HP or your support staff.

Processor:	hp e-pc C633	hp e-pc C700	hp e-pc P800	hp e-pc P866
SDRAM	64MB	64MB	128MB	128MB
Hard Disk	10G	10G	20G	20G
FDD	optional	optional	optional	optional
Monitor	no	no	no	no
CD - ROM	24x	24x	24x	24x
OS	Windows '98	Windows '98	Windows '98	Windows '98
Modem	Yes	Yes	Yes	Yes
Software	Word 2000	Word 2000	Word 2000	Word 2000
Part No.:	(B1743)	(B1744)	(B1745)	(B1746)
GST INC:	\$1,958	\$1,998	\$2,459	\$2,697
Rental:	\$21.46	\$21.90	\$24.11	\$26.45

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2512 (12 port managed switch)

(A9703) GST Inc: **\$1,540**

2524 (24 port managed switch)

(B0062) GST Inc: **\$1,945**

HP ProCurve Switch 2312 & 2324

Ideal for low-cost, unmanaged 10/100 connectivity • Lowest Price 10/100 Switch • Includes 2 Built-in Gigabit transceiver slots • Brings 10/100/1000 solutions to the market • Media-flexible ports for uplinks and server connections • HP quality, functionality and performance • Plug and play solution

2312 (12 port unmanaged switch)

(B0063) GST Inc: **\$915**

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HP ProCurve Switch Modules

HP ProCurve Switch Gigabit Stacking Kit
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HP ProCurve Gigabit-SX Transceiver
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HP ProCurve 100/1000-T Transceiver
(A9127) GST INC:

\$763

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HP ProCurve Switch 4000m

HP's 40 port managed 10/100/Gigabit switch provides a scalable low cost switching solution for organisations looking for scalable, expandable, low-cost migration to 10/100/Gigabit. • High speed/media-flexible uplinks including 10/100Base-T, Gigabit-SX, LX, and 1000Base-T. • Switch meshing = high availability with high performance • Stacking capability with single IP address management.



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Memory	64MB SDRAM	128MB SDRAM
HDD	15GB	20GB
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Modem	V.90 56Kbps	V.90 56Kbps
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GST INC	\$2,299^{RRP}	\$2,999^{RRP}
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9700 Series



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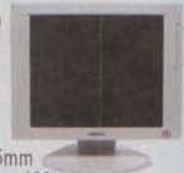
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Mavica CD1000

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Surge
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SOHO2	10 users, 1 X WAN Interface, 10/100 Base-T auto-sensing, 1 X LAN Interface 10/100 Base-T auto-sensing, 10 x VPN tunnels, 3/DES	(B3031)	\$1,250
SOHO2	50 users, 1 X WAN Interface, 10/100 Base-T auto-sensing, 1 X LAN Interface 10/100 Base-T auto-sensing, 10 x VPN tunnels, 3/DES * Upgrade to support 50 or unlimited users (nodes). * For securing SOHO sites or for linking up to 10 sites via VPN.	(B3034)	\$2,498
XPRS2	Unlimited users, 1 X WAN, 1 X LAN, 1 X DMZ Base-T, auto-sensing, Toshiba TX3927 CPU, 3/DES, optional Branch VPN upgrade. Supports multiple Remote User VPN tunnels, 20 x VPN tunnels * For hosting more active or multiple public servers & RU-VPN	(B3038)	\$5,545
PRO	Unlimited users, 1 X WAN, 1 X LAN, 1 X DMZ Base-T, auto-sensing, Rack mountable, 233 MHz StrongARM RISC CPU, Upgradeable memory, Inc Branch VPN Upgrade Supports multiple Remote User VPN tunnels. * For securing large sites, hosting public servers, & RU-VPN	(B3039)	\$7,389
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with cable/DSL interface

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your printer to a
network for
sharing amongst
multiple PC's



10/100 dual speed hubs



FS 105 5 port 10/100
autosensing
(84722) GST INC **\$189**

FS 108 8 port 10/100
autosensing
(70905) GST INC **\$295**

FS 308 8 port 10/100
autosensing
(77242) GST INC **\$465**

FS 116 16 port 10/100
autosensing
(A5347) GST INC **\$556**

FS 516 16 port 10/100 auto-
sensing and internal PSU/Vista
(84722) GST INC **\$189**

FS 524 24 port
10/100 switch - stackable **NEW**
(84722) GST INC **\$189**

PS 105 10 Mbps Print Server
(67225) GST INC **\$229**

PS 110 10/100 Mbps Print Server
(67226) GST INC **\$249**

PS 113 10/100 Mbps Print Server 3 Port
(A3287) GST INC **\$374**

DS 104 4 port 10/100 Mbps
(70795) GST INC **\$165**

DS106 6 Port 10/100 Mbps
(84721) GST INC **\$217**

DS108 8 port 10/100Mbps
(18755) GST INC **\$230**

DS116 16 Port 10/100 Mbps
(81519) GST INC **\$439**

DS508 8 Port 10/100 Mbps
with internal PSU and vista
(18738) GST INC **\$439**

DS516 16 Port 10/100 Mbps
with internal PSU and vista
(18747) GST INC **\$590**

DS524 24 Port 10/100 Mbps
with internal PSU and vista
(69474) GST INC **\$779**

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the power of networking with NETGEAR



RT314



(A8862) GST INC

\$495

Do you want high speed Internet access? Do you want to share it? Do you want security? That means taking advantage of one of the broadband services offered through cable, satellite or DSL and one of the NETGEAR internet routers!

High speed internet access enables you to take your business to new levels of professionalism and efficiency. Just imagine downloading and transferring large complex spreadsheets, heavily animated graphics presentations or multi-media clips in real time, without dial-up hassles, telephone line drop-outs and without tying up your phone line.

The NETGEAR RT314 is a small easy to use secure NAT gateways and offer a great way to put multiple computers on one cable or ADSL connection without using another PC or extra software. These routers have been designed to enable customers to use the latest technology while enjoying the normal ease-of-installation and affordability and reliability that are expected from NETGEAR. It also provides firewall capabilities to protect the computers on your network by shielding them from hackers.



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gigabit fibre + copper

These high performance Gigabit switches provides either fibre or copper backbone connectivity for power workgroups, data centres and server farms. No additional modules are required - each product ready to install straight from box.



10 mbps ethernet hubs



GA 620T 32/64 bit PCI
gigabit network card

(77291) GST INC **\$740**

GS 504T 4 port 100/100
(Copper)

(A1375) GST INC **\$3329**

FS 510T 2 port 100/1000
with 8 10/100 ports (copper)

(A1209) GST INC **\$1789**

FS 518 2 port 100/1000
with 16 ports 10/100

(A1374) GST INC **\$3010**

EN 104TP 4 port hub
(53456) GST INC

\$69

EN 106TP 6 port hub
(57629) GST INC

\$89

EN 108TP 8 port hub
(53458) GST INC

\$99

EN 116 16 port hub
(53459) GST INC

\$215

EN 516 16 port hub with external power
(17425) GST INC

\$259

EN 524 24 port hub with external power and Vista ports
(17435) GST INC

\$315

network starter kits

SB 105
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hub, 2x10/
100PCcards,
cables,
modem
sharing
software
and guide
(A3293) GST INC

\$125

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Location Details**

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Small-Medium Business Networks

For all your small to medium business and home network needs please call for more information and pricing. We have an extensive range of fantastic D-Link products on our database.

DKVM-8

8 Port Keyboard, Video and Mouse Switch

"Easy to use, powerful, and scalable KVM solution" • Controls 8 different server PC's w/keyboard • Utilizes advanced microprocessor emulation, 2 sets of cables, user friendly interface.



**NEW
PRODUCT**

(B2656) GST Inc: **\$859**

DES-1016R

16 Port Switch for Workgroups

Built with advanced functions, these switches are designed for workgroups with advanced requirements. Powerful yet easy to use, they allow users to simply plug any port to either a 10Mbps or 100Mbps node to multiply bandwidth, boost response time and satisfy heavy load demand. Rack mountable.



(98255) GST Inc: **\$795**

DES-1008D

8 Port Fast Ethernet Switch

The D-Link DES-1008D is a powerful desktop Dual Speed 8-port 10/100Mb Ethernet/Fast Ethernet NWay auto negotiating Switch.



(98254) GST Inc: **\$289**

DI-701

Cable ADSL Gateway

The D-Link DI-701 Residential Gateway protects your computers from hackers or unwanted users. It is the easiest and safest way to share your high-speed Internet connection with a DSL Modem or Cable Modem.



(98249) GST Inc: **\$379**

DWL-1000AP

D-Link Air Access Point

Fast 11 meg Performance. Build The Size of Your Wireless Network, or Extend Your Existing Wired Network.

**NEW
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(A9251) GST Inc: **\$995**

DWL-650

D-Link Air Wireless PCMCIA Network Card

11 Megabit Performance. IEEE 802.11b. Make any notebook truly portable within your office environment.

**NEW
Wireless
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(A9247) GST Inc: **\$345**

Other products available from D-Link

Description	Part #	GST Inc
D-Link DP-303 10/100 Print Server (3xParallel Port)	(A8876)	\$310
D-Link DU-560M External V.90 56K Voice/Fax/Data Modem (USB)	(98306)	\$105
D-Link DFM-560I Internal PCI V.90 56K Voice/Fax/Data Modem	(74361)	\$64
D-Link DES-3225G 22+2 port 10/100Mbps Mang Switch W/ V-Lan	(90755)	\$1,979
D-Link DFE908DX 8 Port 10/100Mbps Dual Speed Hub	(60558)	\$289
D-Link DFE-916DX 16 Port 10/100Mbps Dual speed hub	(87207)	\$539
D-Link DFE2624x24-port 10/100Mbps Stackable Dual Speed Hub	(98307)	\$1,149
D-Link DP-602 2 Port Internet Network Server	(81535)	\$379
D-Link DFE-530TX PCI-Bus 10/100Base TX Fast Ethernet Adapter	(62956)	\$42

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See Web Direct Link (at top of page) for more products and latest info!

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PC Cameras



Intel® Pocket PC Camera

Get a great PC camera to go. The versatile Intel® Pocket PC Camera lets you record 2 minutes of video and take up to 128 high-quality pictures either at or away from your PC. Included software lets you make enhanced video phone calls with friends and family over the Internet.

(A6750) GST Inc:

\$379



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computer
needs!



(B1990) GST Inc:

\$295



Intel® Pro PC Camera

One quality PC camera lets you make video phone calls and import video to your PC from your camcorder or VCR! The Intel® PC Camera Pro Pack with the versatile Intel® Pro PC Camera also lets you record video and take snapshots. Then do more with your pictures using the included suite of integrated software.



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points
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purchase
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B1990,
B4373 or
A6749
between
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(B4373) GST Inc:

\$198



Intel® Deluxe PC Camera

Turn your PC into a video phone! The Intel® Deluxe PC Camera includes the Intel® PC Camera and fully-integrated software. Make video phone calls over standard dial-up, broadband Internet connection or regular telephone lines.* Capture video and stills to personalize email postcards. Fun camera games are also included. All in one affordable package.
*Requires Windows 98 and video-ready modem



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available on
all items



Intel® Easy PC Camera

With the Intel® Easy PC Camera, sharing pictures with friends and family over the Internet is a snap. You get a great PC camera and a suite of software for making video phone calls and sending personalized email postcards.

(A6749) GST Inc:

\$118



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**See Page 2 for
Locations**

Modems and Multimedia

Full Product Info:
www.dynalink.com.au

Dynalink Internal 56K V.90 Modems

ISA: All the features of the External. Full Hardware w/ jumpers.

5-Year Warranty.
(77577) GST INC

\$137

PCI: PnP, Send & Receive Faxes, Phone Answer Machine.

(72909) GST INC

\$79

PC-Card

• PCMCIA V.90 56k Modem

• Send & Receive Faxes

• 5-Year Warranty
(A2831) GST INC

\$129

Dynalink 56K V.90 Modem

"Good value for money... ease of setup and use is excellent... consistently connects at high speeds." *PC World Nov 99.* • V.90 / K56flex dual-mode for high Internet compatibility • Plug & play, plus friendly QuickGuide for easy installation • Send and receive faxes from your PC • Supports FaxStream DUET, Caller ID, Speakerphone Mode & VoiceMail.

5 Year
Warranty


(54361) GST INC

\$128

Dynalink USB Pocket Modem

- Super-easy Installation.
- Free-up Slots and IRQs.
- No power supply, no messy cables.
- Dual-mode V.90, fax machine, answer machine.
- Pocket sized for convenience and style!

5-Year
Warranty

(A2298) GST INC **\$138**
NEW!

Dynalink USB WebCam

- Turn your PC into a home video workstation.
- Affordable & simple video conferencing.
- Capture video and digital snapshots.
- E-mail video clips with sound
- Home security capabilities.
- Video software VP-EYE suite included.
- USB simplicity.


(A2832) GST INC **\$97**

Dynalink TV Tuner Video Capture Card

"One of the two best cards in terms of picture quality" *APC, July 9.* Watch TV on your PC & capture incoming video (e.g. from CamCorder). Fully featured, including Teletext & remote control. Resizable window, right up to full-screen (640x480).


Standard: (72860) GST INC **\$118**

With FM Tuner: (78482) GST INC **\$145**

Digi

Connectivity Solutions

AccelePort RAS Family

- Support for speeds up to 56Kbps/V.90
- 4- or 8-port integrated analog modem card
- Includes Digi PortAssist™ SNMP We-based manager for easy configuration and management
- Widest range of OS support
- Device Drivers Developers Kit

Model RAS4: (B2765) GST INC **\$2,699**

Model RAS8: (85977) GST INC **\$4,169**

DataFire RAS Concentrators

- High Density access concentrator (4, 30 or 60 channels)
- Advanced DSP's
- Supports V.90, K56flex, ISDN, and advanced fax applications
- Universal PCI server compliance
- Scalable, modular, and field- upgradeable
- Wide O/S and third-party application support
- Five year warranty

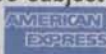
Datafire RAS4: (85976) GST INC **\$4,899**

Datafire RAS30: (85974) GST INC **\$12,769**


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Finance methods are subject to approval.

Australia's Leading Data Communications Products

NetComm® Roadster II 56 Ultra



The Roadster II 56 Ultra is a voice/data/fax modem which lets you transmit and receive faxes and data directly from your desktop. Get on-line in minutes. With UltraConnect technology built-in, this 56Kbps modem negotiates more aggressive transmission speeds which means you surf faster connection. The Roadster II 56 Ultra is a great value package to suit online gamers, small office user and the Internet power user. Its ease of use also makes it ideal for the first time user. • Supports Dual K56Flex & V90 Technology • External Data / Voice / Fax and Speakerphone modem • Slim-line design Error correction and data compression, • Distinctive Ring Simultaneous Voice and Data • Maximum speed of 56,000bps (download only), 33,600bps, V.34, V.32bis, V.42bis, V.42, MNP2-4, MNP5, MNP10EC, • Plug n' Play

(61194) GST Inc:

\$195

NetComm® Tru Connect



A convenient combo card which integrates Ethernet connectivity and 56K Modem with built-in connectors. Uses a single PC Card slot for both your LAN and Modem connection making it the easiest, most cost effective solution for mobile users. 10/100 capabilities, 56K and V.90, includes fax & voice s/ware.

(99747) GST Inc:

\$390

NetComm® Cyber Sentinel



Cyber Sentinel automatically filters & alerts via email against undesirable Internet traffic. It is the most advanced Internet monitoring software available. Includes Free Internet Access! Is ideal for home, school, library or office use. Protects against unwanted illegal downloads of pornography. Lets you decide what they access on the Internet & when they can access it. Parents can determine how much time is spent on the

(A8872) GST Inc:

\$47

Internet. Allows or denies access to email news groups, real time chat groups or web browsing by the individual user. Monitors all Windows-based applications in real-time.

NetComm® Smart I-Share 56



Allows multiple users, in your business or home, simultaneous Internet access using a single Internet account and phone line. • Shared internet access • Integrated 56K modem • Integrated 4 port Ethernet hub • Integrated Firewall • Quick & easy to set up • Supports dial in remote access • Serial port for external ISDN or analog modem • Works with Windows, Unix & Linux operating systems.

(A8868) GST Inc:

\$435

NetComm® Wave SP56



The revolutionary design of the Netcomm Wave takes up less desk space than almost any other product on the market. Allows you to use your PC just like a hands-free telephone with up to 9 password protected mailboxes. Dual V90 and K56flex compatibility. Simultaneous Voice & Data. Built in Speakerphone and VoiceMail. Digital line protection. Includes headset, desktop faxing and voice software.

(B1388) GST Inc:

\$185



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Intelligent KVM Switches

Control multiple PCs or network servers with a single monitor, keyboard & mouse

3 Year Warranty

ServerLink to computer cable

Each end of the cable fans out into three connectors. 2m cable for PS/2 mouse, keyboard and monitor

(63972)
GST INC
\$27

5m cable (63976)
GST INC
\$60

2m cable for AT/Serial mouse, keyboard and monitor

(63974)
GST INC
\$26

5m cable (63977)
GST INC
\$60



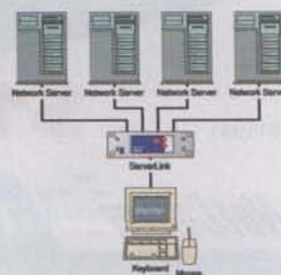
What is a ServerLink KVM Switch?

The ServerLink range of Auto KVM switches allow you to take full control of multiple PCs or network servers with just one monitor, keyboard and mouse. There is no software to load – just plug in your computers, plug in your monitor, keyboard & mouse and you are ready to go. All ServerLink KVM switches are hardware only solutions, totally independent of software and network operating systems. This ensures hassle free installation and error free switching & booting.



On Screen Display

- Select computers via On-Screen-Display or front panel
- Name computers for simple selection
- Mouse & keyboard emulation for flawless booting
- Scan Mode for periodic computer monitoring
- Standard cables used throughout
- Cascadable to control up to 256 computers
- 8 & 16 port models 19 inch rack mounted design
- Australian designed and manufactured



SERVERLINK
INFINITY

PS-2 ONLY

FROM
\$270



SL-421

SL-221	2 Port ServerLink Infinity KVM Switch for PS/2 only	(B3047) GST INC \$270
SL-221-P	2 Port ServerLink Infinity KVM inc. 2 x 2m PS/2 cables	(B3048) GST INC \$310
SL-421	4 Port ServerLink Infinity KVM Switch for PS/2 only	(A9890) GST INC \$330
SL-421-P	4 Port ServerLink Infinity KVM inc. 4 x 2m PS/2 cables	(B2759) GST INC \$412
SL-821	8 Port ServerLink Infinity KVM Switch for PS/2 only	(97888) GST INC \$1,069
SL-821-P	8 Port ServerLink Infinity KVM inc. 8 x 2m PS/2 cables	(97889) GST INC \$1,239
SL-1621	16 Port ServerLink Infinity KVM Switch for PS/2 only	(97890) GST INC \$1,796
SL-1621-P	16 Port ServerLink Infinity KVM inc. 16 x 2m PS/2 cables	(97891) GST INC \$2,127

ServerLink™

PS-2 & AT/Serial



SL-801

SL-401	4 Port ServerLink KVM Switch for PS/2 & AT/Serial	(63724) GST INC \$737
SL-801	8 Port ServerLink KVM Switch for PS/2 & AT/Serial	(63777) GST INC \$1,230
SL-1601	16 Port ServerLink KVM Switch for PS/2 & AT/Serial	(63778) GST INC \$2,069

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Connectivity where & when you need it

3Com® OfficeConnect™

Dual 56K Lan Modem



OfficeConnect Dual 56K LAN Modem brings low-cost, high-speed Internet and Ethernet connectivity to your Small Office/Home Office computers in just minutes! This product is designed for non-technical users that need radical simplicity, high speed Internet access as well as local file and print sharing capability.

(A3358) GST Inc **\$759**

3Com's OfficeConnect Internet Server is the most full-featured, reliable and easy-to-use network server appliance available. In one simple and powerful solution, the OfficeConnect Internet Server empowers small and mid-sized businesses with all the basic Internet management tools necessary to lower overall connectivity costs and improve employee productivity. The unit has built in email, web, file and print servers and a robust firewall to provide security from the outside world. An install wizard and client wizard ensure that the Internet Server is connected to the internet within 15 minutes.

(B2951) GST Inc **\$3,298**

3Com® OfficeConnect™

Internet Server



3Com® OfficeConnect™

E-Mail Server



The Office Connect Email Server is an affordable, easy to install and use, email solution for SB networks that want to dramatically improve their internal and external communications. The complete software/hardware solution can be installed and configured within minutes by a person with no IT expertise using a web-based administration interface and it enables all network users to send and receive email from their desktop.

(B2950) GST Inc **\$1,480**

The Office Connect Network Storage Server is an affordable, easy to install and use, file sharing solution for Small Business networks that want to dramatically improve their efficiency. The complete software/hardware solution can be installed and configured within minutes by a person with no IT expertise and it allows SB to easily add more shared storage space to their network and access shared files locally or remotely over the web.

(B2952) GST Inc **\$1,415**

3Com® OfficeConnect™

Network Storage Server



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& Epping (VIC)

Target Shoppers!

Not all products are in-store, but consulting & advice available on all items

* Capable of receiving downloads at up to 56 Kbps and sending at up to 31.2 Kbps. Due to IC/FCC regulations on power output, receiving speeds are limited to 53 Kbps. Actual speeds may vary. Requires compatible analog phone line and server equipment. See www.3com.com/56k/ for details.

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products
and
latest
info!

"If someone tells you

it takes only 5 minutes

to install up to 240GB

on the network,

DON'T BELIEVE IT."

"I did it in 43.55 seconds."

Don Knisley, Network Engineer, US Air Force

Snap Servers are engineered for one purpose: file sharing. That's why Don could have a Snap Server 2000 up and running on a LAN in 43 seconds! "If I had the choice of installing an NT server for network storage or a Snap Server, I'd pick the Snap Server" says Don. "It's fast, easy and the browser configuration tool is very intuitive." According to a recent PC data report, 4 out of 5 workgroup network attached storage (NAS) servers sold are Snap Servers. That's why Snap Server is the world wide leader and most awarded NAS product on the market today.



1. Plug into AC power



2. Connect to Ethernet hub



3. Turn Snap Server on

© 2000 Quantum Corporation. All rights reserved. Quantum and the Quantum logo are trademarks of Quantum Corporation, registered in the U.S.A. and other countries. Snap Server is a trademark of Quantum Corporation. All other product names are trademarks of their respective companies. Leadership sales claim based on PC Data report June 2000 for hard disk workgroup NAS products under \$5,000.

Ease of Use

- Auto-sensing 10Base-T/100Base-TX
- Automatic recognition of network types/clients
- Supports DHCP, BOOTP and RARP
- Configuration via Web browser

Features

- Embedded OS (unlimited user license)
- Pentium-class processor
- Ultra ATA hard drives
- RAID 5, 1 or 0
- Easily supports 100 or more clients

Compatibility

- Simultaneous support for Windows 2000, NT, NetWare, UNIX, Linux and Macintosh networks and clients across TCP/IP, IPX, NetBEUI and AppleTalk networks

Network Backup

- Compatible with Windows and Netware backup software, including Veritas Backup Exec, Computer Associates ARCserveIT and Microsoft backup software for Windows 95/98/NT/2000

Network Security

- Integrates with Microsoft Domain Controllers or local user list

Guarantee

- 3-year parts and labour

Price

15GB	- (A3489)	GST Inc.	\$1,249
30GB	- (A3528)	GST Inc.	\$1,895
60GB	- (A8926)	GST Inc.	\$3,675
120GB	- (A8118)	GST Inc.	\$6,317
240GB	- (A8119)	GST Inc.	\$9,980



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Surround Yourself With The Very Best

QuickCam™ Traveler



QuickCam Traveler combines easy web communication with the freedom of a digital still camera.

Take it on vacation, to sporting events or parties. It's loaded with features - like a self-timer, macro setting and storage for up to 200 shots. You can adjust resolution or delete duds, then instantly zap the shots into your computer.

QuickCam Traveler is also a video camera that plugs into your PC for all kinds of Internet video: video-conference, video-mail, video-greetings, live broadcasting, animation, even remote video surveillance! With the included video editing software, you can create titles and transitions, add music, narration, sound effects and more!



(A8024) GST Inc:

\$285

QuickCam™ Web

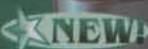


The redesigned Logitech QuickCam Web has everything you need to capture video, send video e-mail, make live video calls, post web albums, broadcast over the Internet and more. With its integrated microphone and excellent assortment of easy-to-use software, QuickCam Web is the perfect Internet video camera for everyone.

(A2833) GST Inc:

\$163

SoundMan DSR-100



100 Watts high-performance speaker system delivers theater-quality digital surround sound for DVD movies and gaming realism. Patented Linear Magnetic Drive technology brings you high-fidelity sound reproduction. Xtrusion aluminium subwoofer provides deep, powerful bass. SoundTouch remote puts control at your fingertips.

(A5409) GST Inc:

\$310

NEW iFeel™ Mouse

This mouse enhances your computing experience with gentle vibrations as you move around the web and desktop. Feel your way around pull-down menus and dialog boxes. No more issues with too small print or information clutter, now you can feel where your mouse goes!



(A7953) GST Inc:

\$85

MouseMan Wheel Optical

Work where you choose, with a mouse that goes anywhere: on desks, chair arms and almost any other surface. It records motion optically, without moving parts to clog up, skip and jump. The sleek, contoured four-button shape delivers maximum comfort and control. 5-year warranty.



(A3057) GST Inc:

\$84

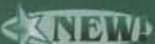
Cordless Freedom Navigator

Logitech's digital radio technology guarantees a reliability that other cordless devices just can't match. iTouch™ keys offer fast access to the Internet and multimedia. Includes Cordless MouseMan Wheel. 5-Year warranty.



(B1477) GST Inc:

\$174



Cordless Freedom Pro

Ideal cordless keyboard and mouse combination for exceptional comfort, cordless freedom and aesthetic design. The split layout with a gentle curvature makes it easy to use. iTouch™ keys for easy access to the Internet and multimedia. 5-Year warranty.



(B1478) GST Inc:

\$199

QuickCam Pro 3000

(B0805)

GST Inc:

\$198



QuickCam Express

(80121)

GST Inc:

\$82



Wheel Mouse Optical

(A5318)

GST Inc:

\$57



Cordless TrackMan FX

(B0831)

GST Inc:

\$160



Internet Keyboard

(A8851)

GST Inc:

\$45



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33

Smart Storage Solutions

HipZip **NEW** Zip **CD**

Digital Audio Player

(B1436) GST Inc: **\$545**
Announcing Iomega's new HipZip™ Digital Audio Player. With its sleek design, this palm-sized player lets you download your favourite MP3 & Windows Media format tunes from the internet, & play them anywhere. The HipZip™ also acts as a PocketZip storage device: download & transport music, spreadsheets, images, etc, up to 40MB per disk.



CD-RW Internal

Iomega ZipCD Internal drive is the ideal way to store, share and archive information in a common 650MB format. Compatible with Windows 2000. Also ships with Adaptec Easy CD Creator v4.02c and Direct CD 3.01.

12x4x32

(A5391) GST Inc: **\$605**

12x10x32

(B0882) GST Inc: **\$570**



Predator **NEW**

Iomega Predator CD-RW drive

Introducing "Predator" - the new, radically designed, compact-sized, top-loading Iomega external CD-RW Drive. Predator is simple to set up using the USB interface, and includes loads of new award winning software, including MusicMatch and Iomega Quik Sync 2, and more.



Predator™ USB CD-RW External

(B4416) GST Inc: **\$647**

ZipCD™ USB CD-RW External 4x4x6

(92623) GST Inc: **\$450**

Zip

250MB USB

(82633) GST Inc: **\$369**
Provides high-capacity storage in an easy-to-use format that can go from desktop to laptop quickly and reliably. Sleek new design. Connect via USB port or through PCMCIA card version which requires no additional power cables. Backward compatible with 100MB Zip media



Drive USB/PC Card Combo (82780) GST Inc: **\$415**

Zip

MEGA TWINS

ZIP CD & ZIP 100MB

(A5399) GST Inc: **\$410**

Introducing the new MegaTwins- the 2-in-1 complete data and entertainment storage solution. Offering a ZipCD Internal drive, and a Zip 100MB Internal ATAPI drive all in one pack, the MegaTwins is the complete solution for managing your information. Also comes with CD-R and Zip 100MB media.



QuikSync2

Quik Sync 2

(B4408) GST Inc: **\$40**

Back up your files without any hassle. Every time you save a file to your hard drive or to a network drive, Quik Sync 2 software automatically makes a copy of that file on an Iomega disk. All you have to do is select folders for the software to monitor. Quik Sync 2 is compatible with Zip, Jaz, PocketZip and Iomega CD-RW drives.



PocketZip

PC Card Drive

Removable solution for notebook users. Store, protect and share important information on a 40MB Click! (1 disk included).



USB docking station

(A2306) GST Inc: **\$89**

Drive PC card & disk

(78902) GST Inc: **\$180**

Drive Mobile

(76743) GST Inc: **\$415**

Disk 10-Pack

(75985) GST Inc: **\$175**

Zip **NEW LOOK**

100MB USB



(B4407) GST Inc: **\$240**

Zip 100MB disk:

(23772) GST Inc:

\$25

10-pack:

(21889) GST Inc:

\$190

Zip PCMCIA SCSI accelerator card

(35145) GST Inc:

\$160

Zip ISA SCSI Zoom accelerator card

(21888) GST Inc:

\$80

Zip drive carry case

(31823) GST Inc:

\$44

Zip parallel cable

(46305) GST Inc:

\$35

Zip SCSI cable

(46304) GST Inc:

\$29

Zip disk labels 20-pack

(48059) GST Inc:

\$5

Zip 6-disk wallet

(35146) GST Inc:

\$21

Jaz 2GB External Drive

(78941) GST Inc:

\$630

Jaz 2GB disk

(61652) GST Inc:

\$205

Jaz 2GB 3-pack

(57271) GST Inc:

\$540

Jaz 1GB disk

(24218) GST Inc:

\$199

Jaz 1GB 3-pack

(32844) GST Inc:

\$490

Jaz PCMCIA SCSI card

(44744) GST Inc:

\$215

Jaz universal power supply

(35154) GST Inc:

\$55

See www.ht.com.au/cat/iomega for more info on these products

The following items are Windows ME compatible • Zip 100 (Parallel, SCSI, ATAPI, USB), • Zip 250 (Parallel, SCSI, ATAPI, USB, Firewire) • Jaz 1GB (SCSI, Parallel, USB) • Jaz 2GB (SCSI, Parallel, USB) • ZipCD (All speeds and interfaces) • HipZip • Click! PC card drive (PC Card drive and PCMCIA adapter).

CD-R/CD-RW: Storage for life

Verbatim CD's represent the latest in technology. Featuring a proprietary blue Metal-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

Verbatim CD Recordable and Rewritable Discs

CD Recordable - 10 Pack



74 Min. 650 MB
1x - 16x, 10 pack

(B4329) GST Inc:

\$17

NEW!

Audio CD Recordable and Rewritable



74 min recordable
74 min rewritable

(B4327) GST Inc:

\$5

CD Recordable - Singles

74 Min. 650MB 1x - 16x Singles



(74740) GST Inc:

\$2

CD Recordable - Printable Surface

74 Min. 650 MB Printable Surface
1x - 16x, 50 spindle pack



(93471) GST Inc:

\$79

*Printable surface
also available in
jewel-case

CD Recordable - 80 Minute Colors



80 Min. 700MB,
1x-12x, colored
CD-R's in
matching
superslim cases
25 pack

(B1355) GST Inc:

\$39

CD Recordable - 80 Minute



80 Min. 700MB,
1x - 16x, 10 Pack

(B1354) GST Inc:

\$19

700MB

DataLife Floppy Diskettes



The world's No 1
Floppy Disk
DSHD IBM format 3.5"
Floppy Disks

**11th Disk
FREE!**

(79452) GST Inc:

\$6

*comes in pack

CD ReWritable

650MB CD Rewritable 2x-4x



(77492) GST Inc:

\$4

650MB CD
Rewritable High
Speed 4x-10x
(B2658) GST Inc:

\$6

CD Travel Case

Lightweight.
Scuff proof
exterior.
Fabric lined
disc holders
prevent
scratching
and sticking
of CD's.



For 24 CD's:
(79583)
GST Inc:

\$19



For 48 CD's:
(79584)
GST Inc:

\$25

Headset with Microphone



Vertical in-ear
stereo headphone
with adjustable
microphone
boom. Ideal for
notebook users.
Designed for
multimedia
convenience.
Lightweight and
compact,
adjustable
headband. (Must
be powered by
a soundcard)

(77819)

GST Inc:

\$18

Verbatim



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Copying and Connectivity

Verbatim CopySmart One to One CD Duplicator

8x Record, 4x ReWrite, 32x Read

8x



8x Record, 4x ReWrite, 32x Read Stand Alone Duplicator. Introducing the simplest and most affordable way to duplicate a low volume of CD-R or CD-RW discs. Place your original CD in the 32x CD-ROM drive, a blank CD-R or CD-RW in the recorder and then just press start to duplicate the CD-ROM. The CopySmart can also be connected to a Mac or PC for use as a standard external reader/writer.

PCI SCSI card and connecting cable included.

(B2904) GST Inc **\$1,397**

Verbatim
Signature III
InkJet CD
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(89186)
GST Inc

\$2,799

Verbatim
Inscripta
Thermal CD
Printer



(B2932)
GST Inc

\$5,415

Verbatim
Composer
Autoloading
CD Duplicator
(B2933)
GST Inc

\$4,763

Optional
Inscripta or
Signature III
printer available.



Conductor-
autoloader
(B2934)
GST Inc

\$2,965

only for
Signature III or
Inscripta Printer

HARDWARE

Verbatim PCI FireWire Cards



Update your PC with firewire! With the included Ulead Video Software and cable you can download directly from digital video camera to your hard drive. Repeater hubs and cards also available.

PCI FireWire Card - 4 ports	(90689)	GST Inc	\$172
PCI FireWire Card - 6 ports	(A5161)	GST Inc	\$216
PCI FireWire Repeater Card - 5 port	(A5162)	GST Inc	\$180
PCI FireWire Repeater - 6 port	(A5163)	GST Inc	\$154
PCI FireWire Repeater - 10 port	(A5164)	GST Inc	\$204
6 pin to 6 pin FireWire cable	(B2905)	GST Inc	\$33

Verbatim PCI SCSI Cards

Expand and enhance your PC with a PCI SCSI Card.

Common

IDE drives in today's PC's slow down your machine every time they read or write to a drive. SCSI works almost completely independently of your PC allowing it to run faster during drive activity.



PCI Bus, Ultra-SCSI	(90681)	GST Inc	\$84
PCI Bus, Ultra-Wide	(90683)	GST Inc	\$168
PCI Bus, 2 channel Ultra-Wide	(90684)	GST Inc	\$366
PCI Bus, Ultra2-Wide	(90685)	GST Inc	\$277

Verbatim USB Hubs & Cards

USB has been designed to allow many devices to be connected in a very easy way to a PC or MAC. Most new PC's have USB, but plug-in cards can add USB ports to older machines. The use of a hub enables a single cable to be expanded to as many as 6 cables.



USB Hub - 6 ports	(79702)	GST Inc	\$99
PCI USB Card - 2 ports	(84801)	GST Inc	\$44
USB Network Cable	(B4328)	GST Inc	\$107
USB to Printer Cable	(84803)	GST Inc	\$33
Internal 3.5" USB Hub - 4 ports	(B2909)	GST Inc	\$99
USB to 10/100 Ethernet Adapter	(B2912)	GST Inc	\$119

Verbatim IDE Acceleration & Expansion Card



PCI IDE Ultra DMA 100 Card: Speed up your PC's new hard disk drives with this PCI plug in Ultra DMA 100 card. Supports transfer speeds of up to 100MB/s with new ATA100 drives, and includes the ability to run up to 4 extra IDE or ATAPI drives on your system.

PCI IDE Ultra DMA 100 Card	(90688)	GST Inc	\$77
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Finance methods
subject to approval

Backup and Portable Storage

Verbatim MirrorSmart - UltraWide SCSIIDE Raid Mirror Subsystem

NEW



The MirrorSmart provides complete protection for your important files. Uses RAID1 to allow disk mirroring and rebuilding functions. You will never have to worry about hard disk failure again with the MirrorSmart - providing high data security for a low cost. Features: • Drive Hot SWAP and instant rebuild • Built-in RAID On a Chip(ROC) SCSIIDE engine • Uses standard IDE Hard Drives

(B2913) GST Inc **\$1,079**

Verbatim

Slim-line PC Card DVD-ROM drive.

Ideal for mobile multimedia applications, 8x DVD-ROM drive & 24x CD-ROM reader.



(B2931) GST Inc

\$700

Verbatim

PCI Cards

Add super fast serial and parallel port interfaces to any PCI equipped PC. Priced from

\$77



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Verbatim Digital Memory - CompactFlash



With CompactFlash Digital Film you can increase the storage capacity of any compatible digital camera or PDA. CompactFlash card adapters convert CompactFlash into the PCMCIA Type II Card format.

8MB CompactFlash	(B2919)	GST Inc	\$66
16MB CompactFlash	(B2920)	GST Inc	\$78
32MB CompactFlash	(B2921)	GST Inc	\$140
64MB CompactFlash	(B2922)	GST Inc	\$244
128MB CompactFlash	(B2923)	GST Inc	\$520

Verbatim Digital Memory - SmartMedia

SmartMedia cards expand the storage capacity of any compatible digital camera. The SmartMedia Card Adapter converts SmartMedia Cards into the PCMCIA card standard and is compatible with PCMCIA Type II sockets.



8MB SmartMedia	(B2914)	GST Inc	\$44
16MB SmartMedia	(B2915)	GST Inc	\$78
32MB SmartMedia	(B2916)	GST Inc	\$140
64MB SmartMedia	(B2917)	GST Inc	\$292
SmartMedia Card Adapter	(B2918)	GST Inc	\$109

Verbatim FlashPath Floppy Adapters



Works from your PC's Floppy Disk Drive. FlashPath is an electronic device shaped like a floppy diskette - it fits into and works from a 3.5" floppy disk drive allowing you to easily transfer data from your flash media card to your PC by simply using your existing floppy disk drive.

FlashPath SmartMedia Reader	(B2924)	GST Inc	\$160
FlashPath MultiMediaCard Reader	(B2925)	GST Inc	\$160

Verbatim Digital Card Drives

Exchange data between your PC, laptop, or Digital Camera with our range of PCMCIA Readers/Writers.



USB Port SmartMedia and Compact Flash Card Drive	(B2926) GST Inc	\$95
USB Port ATA Card Drive	(96056) GST Inc	\$99
Parallel Port ATA Card Drive	(A0064) GST Inc	\$99

Verbatim Slim-line PC Card CD-ROM Drive



Add a CD-ROM to your Laptop!

This 24x CD-ROM can connect to any PC Card enabled PC or Notebook and is ideal for mobile computing for notebook users with no CD-Rom drive built-in. The drive is plug-and-play making installation a breeze and the slim-line tray reduces the size of traditional external PCMCIA CD-ROM drives through its lightweight and low profile design. The control panel on the top of the case allows for easy playback of audio CD's.

(97766) GST Inc **\$315**

Verbatim CompactFlash v.90 56k Fax Modem



Add full 56k modem capabilities to your Palmtop or handheld Windows CE device. Browse the internet or collect your email from any remote location with a normal phone line.

(B2929) GST Inc **\$280**

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MaxAttach NAS System

MaxA40: 40Gb (A2201) GST INC.	\$2,124
MaxA160: 160Gb (B2053) GST INC.	\$4,623
MaxC80: 80Gb (A2204) GST INC.	\$4,349
MaxC160: 160Gb (A2205) GST INC.	\$6,650
MaxC240: 240Gb (A9090) GST INC.	\$7,969
MaxC320: 320Gb (B2051) GST INC.	\$9,175

Simplest way to add a File Server to any NT or Unix Network.



- Simply plug into your ethernet
- Only 5 mouse clicks to install...
- In 10 minutes you have 40, 80 or 160Gb of disk storage on line.
- Simple Web Browser administration.
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- 95/98NT and Unix network compatible
- Now in 1 RU high models (4.5 cm high)
- Disk Spanning, JBOD or Raid level 1 built-in
- Free Reflect-It software to automatically backup you laptops or PCs.

Maxtor Firewire Disk Drive Model 1394

Max1394-40Gb External Disk Drive

- 40 Gb Raw Ultra ATA Disk
- Firewire ready, or use PCI Card
- (B4381) GST INC **\$665**

Max1394-80Gb External Disk Drive

- 80 Gb Raw Ultra ATA Disk
- Firewire ready, or use PCI Card
- (B4382) GST INC **\$945**

Max1394PCI Adapter Card for Windows 98/2000

- 400 MB/sec Firewire Interface
- Mac and PC Compatible
- Plug and Play
- (B4383) GST INC **\$120**



More from Digital Tape Solutions



Quantum DLT4000/ST (70917) GST INC **\$2,832**

Quantum DLT8000/ST (82501) GST INC **\$7,158**

DLTtape media DLT2000XT 15/30GB Tape (68362) GST INC **\$80**

DLT4000 20/80GB Tape (71231) GST INC **\$155**

DLTclean Cleaning Tapes (97851) GST INC **\$93**

ECRIX VXA-1 Tape Drive

INTERNAL (91106) GST INC

\$1,759

EXTERNAL (91110) GST INC

\$1,995



- 33 GB Native, 66GB compressed
- 3-6MB sec sustained, that's 21.6GB/Hr
- SCSI-2 and LVD models available.
- Variable speed operation matches data throughput to your computer
- Packet based technology guarantees reliable restores
- LINUX approved
- Variety of case colours (*White, black, red, translucent)
- Compatible with most backup software

Benchmark DLT1 Tape Drive



INTERNAL

(88037) GST INC

\$3,199

EXTERNAL

(88038) GST INC

\$3,730



- 40GB native, 80GB compressed
- 3-6MB sec sustained, that's 21.6GB/Hour
- Ultra Wide SCSI LVD interface
- Reads DLT4000 tapes (20/40Gb Only)
- Internal or External models
- LINUX Approved
- 7 tape autoloader available
- Compatible with most common backup software
- Standard DLT form factor

Overland DLT1 Based Autoloader

NEW!



"Lowest Cost DLT compatible Autoloader on the market"

- 400 Gb native, 800 Gb compressed capacity
- DLT1 Single Tape Drive included
- 10 tape capacity
- Overland DLT reliability
- LVD 68 pin SCSI Interface
- Includes 1 data tape and cable
- 20 Gb/Hr throughput.
- Optional On-site warranty.

(A0476) GST INC **\$9,140**

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The Future of USB is Here...

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USB Hub



A Belkin USB
4-port hub!

This compact modular hub allows you to connect 4 USB devices to a single USB port, and it fits almost anywhere.

Take advantage of full Plug-and-Play capability to make installation a breeze.

(96865) GST Inc: **\$85**

Firewire PCI Card

Capture your world in digital video! The IEEE 1394 PCI Host Adapter transforms the desktop PC into a DV-editing bay. With data transfer speeds up to 400Mbps, this IEEE 1394 (FireWire® or i.LINK or IEEE 1394) innovation delivers lightning-quick video input & output. Its bus supports up to 63 hot-swappable devices!

(A7792) GST Inc: **\$126**

USB Direct Connect

With the Belkin Direct Connect you can play multiplayer games at speeds up to 150 times faster than a 56K modem. Now you're really cooking! Join computers without any networking hassle. Simply plug the Direct Connect in and the installation program does all the work for you.

(96890) GST Inc: **\$90**

USB VideoBus II



Captivate your audience with exciting graphic effects. You create the show yourself with your PC and camcorder merged into a desktop video studio by the Belkin USB VideoBus II.

The Belkin USB VideoBus II, complete with MGI VideoWave III SE software, gives your PC the power to make stunning movies and more!

(B4412) GST Inc: **\$call**

USB Cable



A Belkin Pro Series USB device cable will keep those dream machines error free. Features high performance 20-gauge

power wires that allow you to maximize the full potential.

*Also available in colors: blue, grape, lime, tangerine, & strawberry

USB Device Cable,
A-B, 1.8m - (96893) GST Inc: **\$12**
A-B, Gold 1.8m - (96875) GST Inc: **\$17**
USB Extension Cable,
Male-Female, 1.8m - (96895) GST Inc: **\$14**
Male-Female, Gold 1.8m - (96878) GST Inc: **\$18**

Printer Cable

This Pro Series Parallel Printer Cable links your IEEE 1284 printer with a Centronics 36-port to your PC with a DB25 port. Featuring our exclusive wiring design & cable technology that guarantees optimal performance & data transfer.

IEEE 1284 Parallel Printer Cable:
A-B, 3m - (96929) GST Inc: **\$18**
A-B, Gold 3m - (96930) GST Inc: **\$22**

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EPSON STYLUS COLOR 480

This printer brings the quality and performance of our PerfectPicture Imaging System within everyone's reach. It offers the fine-grained detail of Ultra Micro Dot Printing, and the speed and beauty of Variable-Sized Droplet Technology. With the new simple-to-use design, this printer makes perfect sense as your home inkjet printer.

(A0409) GST INC
\$154



EPSON STYLUS COLOR 580

Ideal for home, school and home office use, this printer provides easy, plug-and-play support for Windows 98/2000 and USB equipped Macintosh systems, and comes with everything you need to print beautiful colour photo's, presentations, newsletters, reports...

(A8092) GST INC
\$214



EPSON STYLUS COLOR 680

With industry leading 2880 dpi print resolution and super fine 4pl Micro Droplets, images produced from this printer indistinguishable from photographs. EPSON's exclusive Micro Piezo technology ensures high-speed throughput with crisp, sharp text, making this printer the perfect PC partner in any Home or Home Office environment.

(A8093) GST INC
\$299



EPSON STYLUS COLOR 880

Here is an inkjet printer that offers everything today's business users demand - speed, super-sharp text, beautiful graphics & super smooth operation, thanks to EPSON's Micro Piezo technology. Offering high print speed & industry leading print quality, this printer is perfect for any office environment.

(B0581) GST INC
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LaserJet and InkJet Printers

HP LaserJet 6l pro



• 6ppm • economode cuts printing costs by 50% • power save mode reduces energy costs • 18-second first page out • patent instant-on fuser eliminates printer warm-up time • fast return to application • supports a wide variety of media sizes and types (letter, envelopes, transparencies and card stock) • Supports DOS and Windows 3.1, 3.11, 95, 98, NT 4.0 environments

(B4399) GST INC **\$642**



HP InkJet 2250/2250TN

2250 (A3362) GST INC **\$1,320** 2250TN (A3363) GST INC **\$1,895**

The HP Business Inkjets 2250 and 2250TN come with all the features of the 2200, and also include: • HP PCL5Ce, HP PostScript level 2 emulation • 24MB RAM upgradeable to 88MB • Two 96MHz Motorola processors on board • HP JetDirect 600N internal print server (2250TN only) • Additional 250-sheet input tray (2250TN only)



HP Business InkJet 2200

(A3361) GST INC **\$942**

The HP Business Inkjet 2200 has a higher print speed (normal mode) than any other HP inkjet. And, like the other two printers in the range, it's extremely cost effective. • 15ppm black printing, 14ppm spot colour printing, • HP PhotoREtIII • HPA™ installed • 250-sheet input tray • 8MB of memory • One 96MHz Motorola processor on board



HP LaserJet 1100 Printer

1100 Printer (70095) GST INC **\$699**

1100A Printer- Copier- Scanner (70096) GST INC **\$845**

HP's JetPath technology allows you the flexibility to expand the LJ 1100 into an all-in-one performer when your business needs grow. Crisp, sharp 600dpi laser printing. 8ppm. 2MB RAM.



HP LaserJet 4550 Series

HP Colour Laserjet 4550 A4 16PPM 64Mb (B2381) GST INC **\$4,175**

HP Colour Laserjet 4550N A4 16PPM 64Mb 10/100 (B2381) GST INC **\$4,699**

The HP Color LaserJet series printers are ideal for professional end users in workgroups and business departments who need to create documents which offer a competitive advantage in selling their ideas, products or analysis to external customers or internal managers through proposals, reports and newsletters.



HP LaserJet 2100 Series

LaserJet 2100 A fast flexible laser with room to grow. EIO, PCL 6, 4MB RAM. (72291) GST INC **\$1,249**

LaserJet 2100M A fast flexible laser with PS and PCL. EIO, PCL 6, 8MB RAM. (72292) GST INC **\$1,399**

LaserJet 2100TN A complete network printer. EIO, PCL 6, 8MB RAM, additional 250-sheet feeder, HP JetDirect print server installed. (72293) GST INC **\$1,659**



All models feature:

- 1200dpi resolution
- 10ppm print speed
- 60MHz processor

- 350-sheet capacity
- 15,000 page monthly duty cycle
- Excellent performance

HP LaserJet 4050 Series

LaserJet 4050 PCL 6, 8MB RAM. (77443) GST INC **\$1,999**

LaserJet 4050N PCL 6, 16MB RAM. (77445) GST INC **\$2,459**

LaserJet 4050TN PCL 6, 16MB RAM (77446) GST INC **\$2,999**



All models feature:

- 1200dpi resolution
- 16ppm print speed
- 133MHz processor
- 500-sheet capacity



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HP OfficeJet K60

Compact, all colour, sheetfed print, fax, scan & copy all-in-one
• Print up to 2400 x 1200 dpi colour, up to 600 x 600 dpi black with HP PhotoREt 3 • High-quality scanning captures subtle details for accurate reproduction of originals at 600 x 1200 dpi optical (up to 2400 dpi enhanced) and 36-bit colour

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HP OfficeJet T45

All Colour: Printer, Copier, Scanner & Fax • 600x600dpi InkJet Printer with HP PhotoRET II • Up to 9ppm print speed (black) and 6.5ppm (colour) • 75 speed dials, 55 page fax memory • Up to 1200dpi enhanced (300dpi optical) scanning, 24bit colour.

(84356) GST INC

\$659


HP DeskJet 990C

Best Photo-Quality Plus Premier Business Printing • Infrared printing from PDAs, notebook computers, and other mobile devices. • Up to 17 ppm in black, 13 ppm in color • Optical sensor detects paper type, then selects the ideal print mode HP PhotoRET III

(B1967) GST INC

\$760


HP DeskJet 930C

Compact Photo-Quality Colour InkJet Printer • Alternative 2400x1200dpi mode on photo paper with HP PhotoRET 3 • Excellent results on all types of media in all modes • Prints up to 9ppm black and 7.5ppm colour.

(95761) GST INC

\$295


HP CDRW 9140i & 9500i

Model	9140i	9500i
Speed	8x4x32	12x8x32
Copy & create universally readable CDs	HP MyCD	HP MyCD
CD creation using drag & drop	Adaptec Direct CD 3.01	Adaptec Direct CD 3.01
High speed CD-RW disc formatting	HP Fast Format	HP Fast Format
Full system backup	HP Simple Backup	HP Simple Backup
Multimedia organiser		Broderbund Multimedia Pr
Create stationery, greeting cards & more		Corel Print Office 2000
MP3 downloads	HP Music Jukebox	HP Music Jukebox
CD labelling	CD labeler	CD labeler
Included media	1xCD-R	1xCD-R, 1x high per, CD-RW
Buffering	2MB	4MB
Able to create all type of CDs	Yes	Yes
Able to format CD-RW disc under 3 minutes	Yes	Yes
Able to do a full system backup	Yes	Yes
Download MP3 files & store on CD	Yes	Yes
Download MP3 files onto CD to play in a discman	Yes	Yes
A solution with a CD labeler	Yes	Yes
Write & read high performance CD-RW media	Write- No, Read- Yes	Yes
Write & read normal CD-RW media	Yes	Yes
Write & read CD-R media	Yes	Yes
Part #	(A8090)	(A8087)
Inc GST	\$379	\$560



Easiest to Install & Use!

You can create data CD's, audio CD's, photo CD's and multimedia CD's.

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SnapScan
1212p
(74495)
GST Inc:
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T1200.
(75581)
GST Inc:
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Batch Slide
holder set for
DuoScan
T1200.
(75582)
GST Inc:
\$197



DuoScan
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SCSI-2. 36 bit.
Transparency
scanning.
Opt. res.
600x1200ppi
(74498)
GST Inc:
\$1,263



DuoScan
T2500
SCSI-2. 36 bit.
Transparency
scanning. True
opt. res.
1250ppi
(74499)
GST Inc:
\$8,319

SnapScan e20

600x1200 optical resolution (9600 maximum), 36bit, USB interface, Mac & Win98/Win2000Me compatible. Includes 3 interchangeable coloured handles, Software package includes Agfa ScanWise, Readiris and Corel PrintOffice 2000



(B1175) GST Inc: **\$195**

SnapScan e40

1200x2400 optical resolution (9600 maximum), 42bit, USB interface, 3 interchangeable coloured handles. Agfa bundles Corel Print Office 2000 and Readiris. Corel Print Office makes it easy to create impressive documents and Web pages. Readiris, which recognizes 55 languages, lets users easily convert hard-copy documents — originals, faxes and photocopies—into editable text. All software provided is available in 5 languages, for both Windows (including Windows 2000) and Macintosh platforms.

(A5009) GST Inc: **\$314**

SnapScan Touch

Agfa's revolutionary SnapScan Touch USB Scanner has four programmable buttons: scan direct to file, email, fax or printer, 600x 1200 ppi, 36 bit, landscape desktop scanner. Comes with 7 translucent coloured handles! Software: Agfa ScanWise, Caere OmniPage LE, Caere PageKeeper (PC only) Micro Frontier Color IT! (Mac only) and Corel Print House



(87209) GST Inc: **\$229**

ePhoto CL20

1280 x 960 max resolution (with PhotoGenie). Dual Mode: still image and live action. Stores 10-30 images on 1MB internal memory. CompactFlash slot for optional storage on CompactFlash cards (card not included). Built in flash. Extensive software package includes: Agfa Twain Driver, AgfaCam Mounter, Agfa PhotoWise 3.0, ArcSoft Video Impression, MicroSoft NetMeeting, AGFAnet client software, Acrobat Reader

(B1153) GST Inc: **\$335**



SnapScan e50

1200 x 2400 optical resolution (9600 maximum), 42 Bit, USB interface, Integrated TPO for transparency and negative scanning, 4 front panel buttons (programmable), 3 interchangeable coloured handles and button covers. Agfa ScanWise and comprehensive software package including Corel Print Office 2000 & Readiris.

(99759) GST Inc: **\$379**



ePhoto CL18

Dual Mode: (point-and-shoot digital camera with video conferencing, video clipping and video e-mailing features), VGA (640 x 480 pixels) optical resolution with CMOS sensor, 32 images on internal 2Mb memory (non removable), Optical viewfinder, Built-in Flash, ISO 200, Includes camera cradle for video conferencing, USB interface. Excellent s/w bundle (Twain driver, Corel PrintHouse, Corel PhotoHouse, Microsoft NetMeeting, ArcSoft VideoImpression)



(99757) GST Inc: **\$280**

ePhoto CL30Clik!

The fantastic ePhoto CL30 now available with built-in Iomega Clik! Drive. Mega-pixel digital camera with USB interface and a resolution of 1440x1080 pixels. Features an optical viewfinder and 1.8" colour LCD screen. Auto focus lens with 2x digital zoom and macro function.



(89409) GST Inc: **\$1,059**

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Can on a Canon, Can Do!

BJC-1000SP

Super Economy Mode in Black/White & Colour

- Vivid colours, on plain paper.
- Photo Mode colour, optional PhotoRealism.
- Auto image improvement.
- Print banners, up to 6 A4 pages, envelopes, transparencies, glossy photo paper, high gloss film & T-shirt transfers.



(A1792) GST INC

\$99

BJC-2100SP

High performance at a low price - the ultimate printer!

- Ultra compact design.
- Up to 5ppm in monochrome.
- Up to 2ppm in colour.
- 4-colour photo printing.
- Optional colour image scanning.
- Range of driver features.
- Banner printing.
- USB + parallel interface.



(A3173) GST INC

\$137

A4 BJC- 3000



(94499) GST INC

\$225

- Up to 9ppm print speed black
- 1440 dpi
- Separate replacement colours

A3/A4 BJC- 6500



(95962) GST INC

\$569

BJC-6200

Compact design and uncompromised performance!

- 6-colour photo printing.
- Optional colour image scanning.
- Separate colour ink cartridges!
- Up to 10ppm in monochrome.
- Up to 7ppm in colour.
- USB + parallel interface.
- 1440 x 720 dpi.



(A3507) GST INC

\$330

LBP800

8ppm Desktop laser

- 300x300dpi, 600x600dpi
- 2,400dpi with text & line smoothing.
- 2,500 pages per cartridge (5% cover).
- 512K buffer.
- Win® 95, 98 and NT 4.0.



(83787) GST INC

\$480

MOST COMPACT, LIGHTWEIGHT FLATBED SCANNERS AVAILABLE!

- OmniPage OCR software included (N650U & N1220U Only) Full V9.0
- Plug & Play
- Fully integrated software package



- Silent & fast scanning
- Super slim & compact

N650U

600x1200dpi.
(A3522) GST INC

\$160

N1220U

1200x2400dpi.
(A3523) GST INC

\$240

FB1210U

1200x2400dpi
(A3524) GST INC

\$419

D660U



With 42 bit output for Windows 98, 2000 and USB Mac Systems. Fast one pass USB scanning. 600x1200dpi film scanning via film adaptor built-in to scanner lid.

1200x2400dpi
(A8903) GST INC

\$250

LBP1000



10 PPM
1200 dpi
PCL6
4 MB RAM

(95983)
GST INC

\$1,060



N340P

300x600dpi
(A8919) GST INC

\$99

A4 Colour parallel flatbed scanner. Fast 1 pass scanning. Unique LIDE contact image sensor technology. 600x1200dpi. Incredibly thin (39mm).



N640P

1200x2400dpi
(A7655) GST INC

\$128

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- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base to On-Site



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Xerox sets the standard for workgroup colour printing, from solid ink to colour laser, the fastest speeds available to 1200dpi resolution — what ever your requirements, you can be sure there's a Phaser Colour Printer from Fuji Xerox Phaser Printing that is designed for your application. All phaser colour network printers offer the experience and strength from the integration of both Tektronix and Xerox, delivering you world class technology and support.

which
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colour
network
printer?

Product	Max Paper size	Business Type			
		Small	Medium	Large	Graphics
740	A4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
750	A4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
850	A4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
1235	A4		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
790	A3			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

X PHASER 1235N A4 Colour Printer

A Breakthrough in Laser Class Colour:

The new Phaser 1235 from Fuji Xerox closes the gap between the print speeds of black printing and the brilliance of colour. A revolutionary product delivered from the merger of Tektronix and Xerox, single pass, full colour printing at 1200 dpi at 12 pages per minute is now possible. Plus all you expect including fast networking and connectivity to have your entire workgroup printing in colour immediately, and user focussed features to deliver reliability page after page. See what breakthrough colour from Fuji Xerox can do for your business.

NEW



- ☒ Dependability and power
- ☒ Flexible paper handling
- ☒ Superior colour quality
- ☒ Breakthrough Speeds

(B2971) GST Inc: **\$8,069**

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Finance methods are subject to approval.

Your Colour Laser Printer!

X PHASER 740N Colour Printer

When it comes to all-purpose workgroup performance for your office, the Phaser 740 colour laser printer is an exceptional offer. Start with break through pricing. Raise the bar with rich photographic-quality 1200x1200dpi printing at 16ppm black and 5ppm colour. And top it off with reliability you can count on print after print, you'll be plugged in and printing in no time!

(71836) GST Inc: **\$4,249**



X PHASER 750N Colour Printer

Using fifth generation colour laser technology the Phaser 750 brings affordable, dependable colour to workgroups of all sizes. It's now processing faster for the busiest departments; easy enough for everyone to use and improves on the superb print quality you've come to expect from every Phaser colour laser printer.

(A1401) GST Inc: **\$5,739**



X PHASER 850N Colour Printer

An exceptional, network ready, powerhouse colour printer that's literally in a class by its self in terms of technology and lower total cost ownership. Imagine printing 14ppm colour in full colour - that's more than twice as fast as most traditional colour laser technology with stunning print quality at the same time.

(90162) GST Inc: **\$5,719**



X PHASER 790N Colour Printer

For dynamic prints — when colour matching is critical and exceptional detail required — you need a Phaser 790 colour laser printer. This new standard for critical colour network printing has the range to handle any challenge: two sided printing, full A3 bleed page size, and media as varied as heavyweight, coated gloss and transparencies. Superior colour tools will print the heaviest coverage or the minutest detail to your exact specifications.

(B2972) GST Inc: **\$13,859**



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& Epping (VIC)

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all items

DV500 Pro

- Provides the ability to burn DVD discs for use on consumer DVD players and computer DVD-ROM drives.
- Create navigable, autoplay MPEG-2 CD-ROMs for use on many current CD-ROM computers
- Ligos LSX-MPEG LE for Adobe Premiere, VCD files encoder
- Free Hollywood FX Bronze for broadcast-quality 3D effects and transitions



(B4417) GST INC

\$2,300

Studio DV PLUS

NEW!

- Digital IN/OUT Capture Card, with Analogue Out Straight to VCR/TV/S-VHS
- MPEG-1/MPEG-2 Encoding
- Windows 98/2000 / Millennium ready
- 1 x Stereo Audio Out Jack
- Plug 'n' Play Installation



(A8908) GST INC

\$575

NEW!

Studio DV

- Capture, Edit and Output DV quality videos
- Connect and control your DV camcorder
- Edit your DV Video's With Studio software
- Create Video CDs and Streaming videos
- SmartCapture technology saves Hard disk space



(87677) GST INC

\$298

DC30 Plus

- The professional choice for Analogue Video Capture / Editing, with Composite & S-VHS IN/OUTPUTS
- Full Version Adobe Premier V5.1
- Full version Acid Audio editing software with on Board Audio, (avoid lip Sync issues)
- Blue Break out Box



(31696) GST INC

\$1,599

Firewire CardBus PC Card

- Video Studio v4 Video Editing Software.
- MPEG-1 / MPEG-2 Editing
- Runs on Windows & Mac Platform



(A1751) GST Inc

\$395

Orange Micro
inc.

Studio DC10 Plus

- Studio DC10 Plus is an affordable desktop video editing solution with the power, features and performance expected in higher end solutions. Captures and outputs full screen video at PAL or NTSC standard, includes the famed miro-INSTANT VIDEO to break the 2GB barrier for Windows. Comes with some great software to assist you with your editing!



(75800) GST INC

\$590

DV200

- Full version of Adobe premier v5.1
- True digital / firewire capture card, for professionals
- Firewire cable & Miro Tools software to overcome 2 gig file size limitation
- 2 external firewire ports



(77104) GST INC

\$1,398

Studio PCTV USB

- All the features of PCTV Pro
- Hot-Pluggable USB external device
- Take Still image using "Snap Shot" button



(85878) GST INC

\$344



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Finance methods are
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Sound you will not believe!

ACS 22 Tower Speaker System



- Produces powerful audio output from two satellites.
- Maintains a small footprint while delivering high quality sound.
- Delivers quality PC audio to the value-orientated consumer.
- Convenient stereo headphone output.

(90501) GST Inc: **\$57**

ACS 33 3 Piece Speaker System



- 3 Piece system dramatically enhances PC audio.
- Compact speaker satellites are powered and magnetically shielded.
- Powered subwoofer extends the low frequency response to add realism and bass.
- Volume control and power on LED.

(90503) GST Inc: **\$112**

ACS 54 PowerPlay™ Plus for Gamers



- Powerful 40 Watt, high performance 5-piece system.
- Compact speaker satellites are power and magnetically shielded.
- Unique bracket/stands provide convenient mounting possibilities for surround speakers.
- Powered wood subwoofer extends the low frequency response to add realism & bass.

(59873) GST Inc:

\$234

ATP 3 3 Piece System



- Two dynamic microdrivers in each satellite deliver all the power and performance of a larger speaker.
- Down-firing 3" mid/bass driver reproduces low-end frequencies for full, rich sound. Speakers are magnetically shielded to prevent monitor interference.
- Powered wooden subwoofer extends the low frequency response for realistic sound.

(A5538) GST Inc: **\$234**

ABA 2020 VoicePod™

VoicePod™ is a unique record and playback device providing the ultimate in high quality voice reproduction for personal computers and the simplest and most efficient method of recording and sending email messages.

Record & attach voice messages to Windows files & E-mail — Add voice notes to documents, drawings & photographs — Hear clean, clear, rich playback of voice messages.



(A5541) GST Inc:

\$191

AIM 4040 IntelliMic™

IntelliMic™ is a high quality microphone for use with personal computers providing the ultimate capability to eliminate background noise and interference.

Capture voice & audio with maximum control of recording environment — Enhances internet telephony & voice recognition accuracy — Provides unparalleled recording flexibility & clarity — Software supplied for on-screen graphic user interface.

Compatible with programs such as Microsoft NetMeeting, IBM Via Voice, Dragon Naturally Speaking, and L&H Voice Express, and others, the IntelliMic offers many software interface options.

(A5542) GST Inc:

\$109



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Professional Video Tools

Matrox RT2000

Professional Realtime Editing
for corporate, event and
multimedia artists



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Bump mapping
effects &
adjustable
keyframe
effects!!!

(89082) GST INC **\$2,698**

- Dual-stream video editing, 32-bit graphics
- Realtime broadcast-quality 3D DVE
- Native-DV and MPEG-2 editing
- 1394, Y/C, and composite I/O
- MPEG-2 output for DVD and CD authoring
- MPEG-1 and RealVideo output for web streaming
- Matrox Millennium G400 high-performance desktop display card
- Complete content creation software bundle- Adobe Premiere RT 5.1, Ulead Cool 3D, Sonic Foundry ACID Music, Sonic DVDIt!

DVDIt! SE (V2.0)



Turn your Videos
into DVD'S

Drag and Drop authoring makes creating DVD's as easy as 1-2-3. You'll start with your edited AVI and Quicktime video and audio files - DVDIt! automatically transcodes them into the correct video and audio formats required for DVD. Then import backgrounds and buttons, text and effects, to create great-

looking menus. Now you can link your video

and audio content to create interactive presentations, training applications or virtually any other interactive video content you can think of. When you're finished, DVDIt! records your content directly to DVD-R or CD-R for distribution.

(A2405) GST INC **\$460**

canopus EZDV

DVRaptor and EZDV now include
SoftMPG Canopus high quality MPEG1
& 2 encoding software allowing easy
creation of VCD and DVD compliant
video files.

From the makers of the award winning DVRaptor:
Fast, Friendly and Easy DV Editing for your desktop.



EZDV is now
also available
with Adobe
Premiere!

- Rock Solid DV Codec - Only from Canopus
- Compatible with DV & Digital8 cameras
- Frame accurate camera control
- Easy to learn & use EZEdit software (included)
- Captures selected clips or complete videotapes
- High speed rendering
- SoftXplode 2D & 3D special effects software (included)
- High Speed filtering & image enhancements

(97877) GST INC **\$595**

EZDV PLUS with Media Studio Pro (V6.0)

(A8924) GST INC **\$795**

DV Raptor

(A8997) GST INC
\$1,199

The DVRaptor is a next generation DV and i.LINK card which links your DV camera to your PC. With the Raptor you can capture your DV footage through the i.LINK connection while simultaneously viewing full motion video on your computer display and video monitor.

with Adobe Premier 5.1

(89050) GST INC **\$1,399**



DVStorm

Introducing DVStorm, a real-time DV editing system that combines a high performance feature set with stability, reliability, and affordability. Boasting render-free, real-time digital video editing, DV and Analogue input/output, MPEG output for DVD, plus Web streaming capabilities, DVStorm is the ultimate digital video editing experience!

DVStorm (B4401) GST INC **\$3,207**

DVStorm With Adobe Premiere (B4406) GST INC **\$3,499**

Mpeg Hardware Module (B4402) GST INC **\$1,144**



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consulting &
advice
available on
all items

DV Raptor



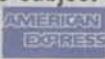
Winner of
the Video
Camera
Magazine's
"Best
Non-Linear
Editing
Product"

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Finance methods are
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Professional Video Tools

Hauppauge TV



(89063) GST INC **\$169**

• Watching Television on your computer has never been easier with WinTV • Watch Live TV (16 Channels) or video on your PC while surfing the Web • Capture motion video and high quality video stills 1600x1200 pixels, BMP, TIF, TGA, GIF, JPEG formats • Video clip capture in Microsoft AVI file format - from TV or any video source • Video conference over the Internet with Microsoft NetMeeting or CU-SeeMe • Win 95, 98, NT 4.0, Win2000 and Linux.

Hauppauge TV GO- FM (89064) GST INC \$209

Hauppauge TV Radio (89065) GST INC \$299

Hauppauge TV USB (89066) GST INC \$270

Hauppauge TV USB (with FM Radio)

(98455) GST INC **\$314**

DV Wizard (A8925) GST INC \$267

Hauppauge PVR

Personal Video Recorder (MPEG2)



- Watch and record your TV shows with instant replay and program pause
- Burn your favorite TV shows onto CD- ROM
- Watch TV on your PC, in a window or full screen
- Pause your TV shows, replay them at any time!
- Record your TV shows to hard disk using high quality MPEG2 compression!
- Burn your TV shows onto CD, play them back on your PC, laptop or DVD player!
- Includes FM stereo radio and IR remote control!

NEW

PCI (B2593) GST INC **\$669**

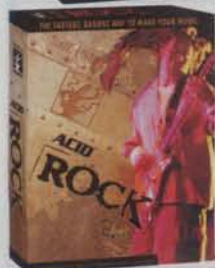


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Sonic Foundry



ACID MUSIC 2.0



The one software package you need to create professional music in any style imaginable including rock, techno, funk, hip-hop, and more! This software is as easy as Pick, Paint and Play. You'll be able to create and edit your composition instantly. Now with MP3 encoding built in.

Acid DJ, Rock or Hip Hop

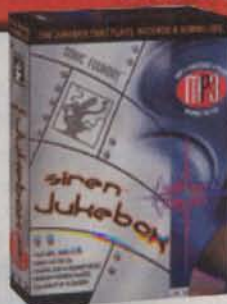
(89069, 89070 or 89071) GST INC **\$105**

Acid Music V2.0 (89068) GST INC \$195

Sound Forge 4.5XP (49646) GST INC \$109

Sound Forge 4.5 (49647) GST INC \$699

Siren Jukebox



**Your personal
music manager!**

Take control of your music. Whatever the format, wherever the playback, Siren lets you do what you want with your music. Let Siren become the hub of your musical universe. With Siren you can play music, record CDs, & write your own CDs!

(89075) GST INC **\$84**

Video Factory

Make Movies in Minutes

- Easy to use—VideoFactory provides a straightforward, intuitive Windows interface that allows you to spend less time learning the software and more time producing great videos.
- Fast results—VideoFactory automatically displays edits and effects in real time—no rendering is required for previewing changes.
- Getting Started tutorial—VideoFactory includes an online startup tutorial that takes you through the video creation and editing process.
- Hundreds of effect and transition combinations—Choose from a huge assortment of special effects and transitions that make your video unique.



(A9258) GST INC **\$195**

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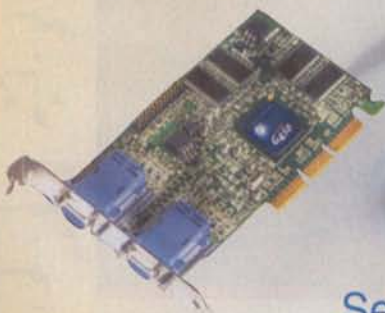
The undisputed industry leader in 2D and 3D Image quality.
Matrox Millennium G450 Dual Head Graphics Acceleration Card

The Matrox pioneered DualHead display, introduced and made popular by the award winning Matrox G400 series, making the millennium G450 the most versatile and feature-rich graphics card on the market today. DualHead offers a host of display features and software utilities that will change the way you work and play on your PC.

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See more, Do more

DualHead Display offers a host of options designed to meet your particular needs.

- DualHead Multi-display
- DualHead Zoom
- DualHead DVDMax
- DualHead TV Output
- DualHead Clone

G45+MDHA16LED (B3108) GST Inc:	\$229
G45+MDHA16DB (B3110) GST Inc:	\$289
G45+MDHA32DB (B3111) GST Inc:	\$387

Powerful 2D and 3D acceleration

- Matrox G450 256-bit DualBus
- 3D Rendering array Processor
- Advanced AGP support
- There are over 35 games that support DualHead and/or Environment-Mapped Bump Mapping (EMBM), including: Star Trek, Armada, Baseball 2000, Destroyer Command, Battlezone II, Combat Commander, The Rift to name a few.

Incredibly Sharp and realistic image quality

- UltraSharp, Lightning-fast 360MHz RAMDAC
- Vibrant Color Quality (VCQ2)
- Environment Mapped Bump Mapping which adds a new level of visual realism to many game environments
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BUSlink Hard Drive. Technology the easy way.

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Stand the drives upwards to save desk space, and for extra hard disc storage, simply stack up more BUSlink FireWire Hard Drives.



BUSlink

BUSlink FireWall Hard drive is a fast, easy way to add additional storage to your computers. You simply plug it into any IEEE 1394 enabled computer. Of course, it is Hot Swap capable! BUSlink FireWire is 30 times faster than those USB hard drives. Making BUSlink FireWire Hard Drive ideal for digital video editing and any high speed, high capacity hungry tasks.

12 Month Warranty, No drivers necessary, package includes card and cables.

20Gb Package

(B4518) GST Inc: **\$649**



desktop publishing



AVI, movie storage



back up



file storage



games storage



portability



MP3 file storage



photo storage

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Kodak

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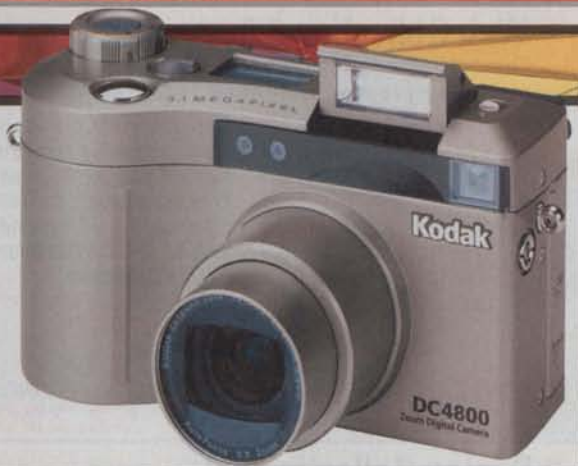
Taking Pictures Further

Kodak DC4800

For passionate digital photographers or those needing the highest possible quality or the widest creative control. Compact size. 3.3 megapixels - super crisp resolution allowing prints up to 11"x17". Six image qualities, from e-mail to uncompressed Tif. Loaded with features. Variable ISO settings (100, 200, 400). Wide angle 3x optical zoom plus 2x digital zoom. Lithium Ion rechargeable battery (rechargeable in camera). Manual & auto settings. Variable colour balance. TTLAF. Special effects. Lens threaded for additional external lenses. Burst capture mode."



(A3295) GST Inc: **\$1,379**



PM200 Printer

NEW!

The most distinctive feature on the Personal Picture Maker 200 is its 1.8-inch, full-colour, LCD preview screen just like those on digital cameras. The fact you don't even need to be connected to a PC, you just insert a memory card from a digital camera (the PPM200 accepts both Smart Media and Compact Flash formats) to print. The preview screen allows you to scroll through all the images on the card, select those to print, choose the number of copies, and in what size and layout. Compatible with Microsoft Windows 98 and Millennium Edition, it connects easily via a USB port.

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FOR LATEST PRICING (B3084) GST Inc:

\$Call



Kodak DC3400

- Two-megapixel resolution means exceptional detail and brilliance - up to 8" x 10" prints. • Its 2X optical zoom delivers crisper close-ups, and its 3X digital zoom lets you get even closer. • User-friendly controls make the DC3400 quick to learn & easy to use. • Zoom Digital Camera, ensuring high quality & no-nonsense performance. • Get connected quickly & easily with its USB and serial cables - it's easy to download, organize, and e-mail your pictures. • Print your pictures with convenience from your own printer.

(A5579) GST Inc:

\$812



Kodak EZ200

Low cost digital point-and-shoot camera that's also a PC/web camera. Compact & light. VGA camera - ideal for easily emailing pictures. Capture short video clips and share via video email. Portable like a traditional camera, but included software also allows camera to be tethered to PC for live video calls. Burst mode for action shots. USB interface. 4Mb internal memory. With removable/adjustable base to allow full tilting & swivelling.

(A7287) GST Inc:

\$245



Kodak

The KODAK DC3800 Digital Camera is the sleek, high-performance, easy-to-use digital camera. Its small size makes it pocket-perfect. The 2.1MP resolution delivers detailed, vibrant pictures on screen and paper. And the 2X digital zoom lets you focus on what's important. The USB COMPACTFLASH Card Reader makes it easy to upload your pictures and its point-and-shoot design makes it user-friendly.

(B1252) GST Inc:

\$710



Kodak DC5000

Rugged, durable, and easy-to-use, the KODAK DC5000 will help you get the job done. The DC5000's weatherproof body will hold up under the toughest circumstances. Two-megapixel resolution provides you with excellent picture quality even on 8" x 10" prints. The 2X optical (30 - 60 mm) and 3X digital zoom let you choose wide angle or telephoto to take pictures in a variety of open spaces. All in all, a practical, intuitive package that is as easy to use as a point & shoot, but tough on the job

(A3540) GST Inc:

\$1,049



Kodak DC3200

Capture fun and spontaneity with the DC3200. One megapixel resolution means eye-catching e-mails and prints up to 5" x 7". Its 2X digital zoom delivers great detail. Two megabyte internal memory and COMPACTFLASH Card capability keeps you shooting longer. And its LCD screen lets you preview your pictures with ease.

(B1255) GST Inc:

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Web Collection 3.0

The cutting edge collection for designing and managing premier Web sites



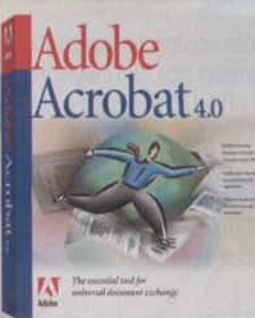
The Adobe Web Collection is a comprehensive software suite that gives you the power to design extraordinary Web graphics, & build dynamic Web sites. It includes three Adobe applications: Adobe GoLive™, Adobe Photoshop® & Adobe Illustrator®

(B1152) GST INC: **\$2,290**



Acrobat 4.0

The essential tool for universal document exchange



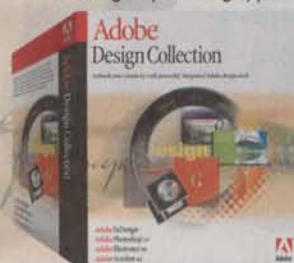
Tired of colleagues not being able to open your documents? Frustrated by software and platform incompatibilities that destroy your documents' look and feel? Adobe Acrobat® is the most reliable, efficient way to share information electronically. It lets you convert any document into an Adobe Portable Document format (PDF) file, with its original appearance preserved, then distribute it for viewing and printing on any system.

(75294) GST INC: **\$499**



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Unleash your creativity with powerful, integrated Adobe design tools
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(A8502) GST INC: **\$2,164**



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The world standard image editing solution
Photoshop® 6.0 software introduces the next generation of image editing with powerful new features that offer something for every user. Now combine vector drawing tools and new layer design features that greatly enhance your creative options. Produce the highest quality graphics with an expanded Web tool kit that includes more timesaving features as well as ImageReady™ 3.0 software for advanced Web production tasks. Master the power of Photoshop faster with user-interface enhancements that make it easy to take full advantage of the comprehensive tool set.

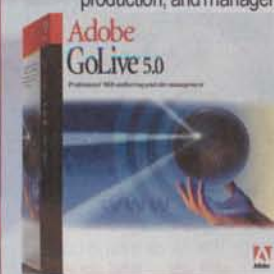
(A8347) GST INC: **\$1,349**



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Professional Web authoring and site management

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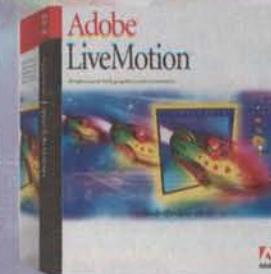
(99749) GST INC: **\$649**



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Take your Web sites to a whole new level with Adobe® LiveMotion™.

Take your Web sites to a whole new level with Adobe® LiveMotion™. Whether you're designing interactive graphics or engaging animations, LiveMotion delivers the intuitive tools you need to create dynamic Web content with ease. And when you're finished, output your compositions to a variety of Web formats, including Flash™ (SWF).



(A1519) GST INC: **\$365**



Illustrator 9.0

Sophisticated illustration software
Adobe Illustrator gives you the freedom to express your creativity & the power to be more productive as you create graphically rich drawings & illustrations for printed documents, presentations, & the Web. If you need to create captivating artwork for printed documents, presentations, or the Web, count on Illustrator to let you push the limits of your creativity with top quality results every time. Explore your creativity. Boost your productivity.

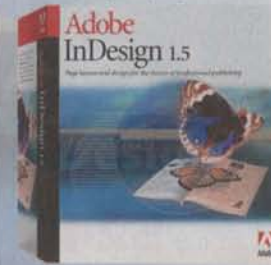


(99750) GST INC: **\$914**



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Adobe InDesign software is a new state-of-the-art page layout program that delivers unprecedented creative freedom, productivity, and precision while integrating seamlessly with Adobe's other leading design programs. Adobe InDesign removes the creative barriers presented by previously available publishing software, providing a powerful new set of tools that can shorten the distance between inspiration and reality.



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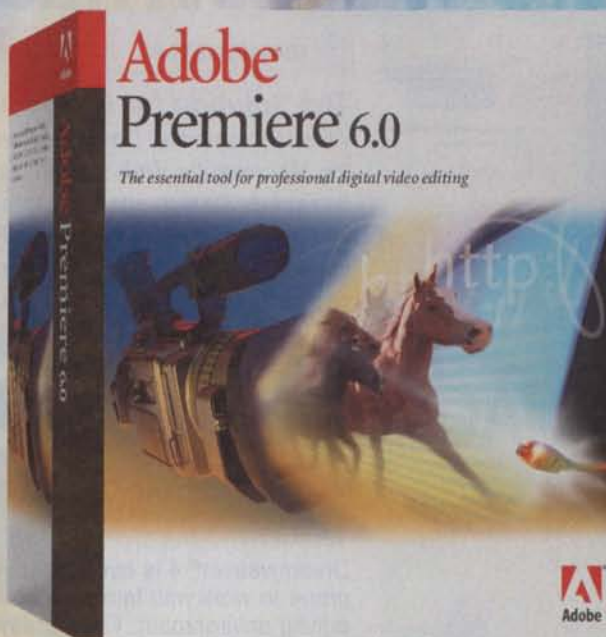
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(B3026) GST INC: **\$660** ★ ★ NEW VERSION ★ ★

The #1 professional web development solution!

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★ ★ NEW VERSION ★ ★



(A1498) GST INC: **\$1,229**

MACROMEDIA FLASH 5

The Professional Standard for Producing High-Impact Web Experiences.

Design and deliver distinctive, low-bandwidth Web Sites with Macromedia® Flash™ 5, the professional standard for producing high-impact, vector-based, Web experiences.



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The Professional Illustration & Layout Solution for Print & Web.

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(95113) GST INC: **\$875**

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MYOB solutions get your BAS right.

MYOB's market-leading small business solutions are dedicated to saving you time and making it simpler to manage Australia's GST and complete the Business Activity Statement (BAS).

MYOB FirstAccounts

(85770) GST Inc: **\$172**

The ideal first accounting system and GST solution for small service-based businesses. No business is too small for MYOB FirstAccounts. Features the innovative MYOB BASlink - which instantly creates a report providing all the GST information your business needs to complete and lodge the Business Activity Statement (BAS).

- Easy to set up & use
- Simple GST management
- Tracks income and expenditure
- Completely customisable forms: invoices, statements, cheques, etc

Compatible with Win 95/98, NT 4.0, Mac OS 8.0.

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MYOB Accounting

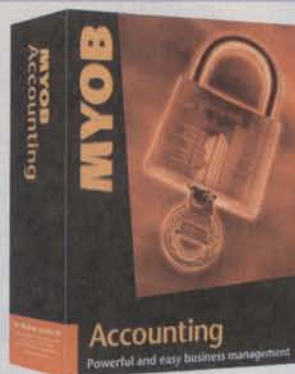
(85771) GST Inc: **\$345**

The simple to use, single-user solution with enhanced GST management for both service and inventory based businesses with around 1-10 employees.

Features include:

- Easy to use, award winning design
- MYOB BASlink
- Powerful inventory, job costing, general ledger, reporting & more
- Includes OfficeLink - the dynamic link to Microsoft Office
- BAS & GST READY

Compatible with Win 95/98, NT 4.0, Mac OS 8.0.

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MYOB Accounting Plus

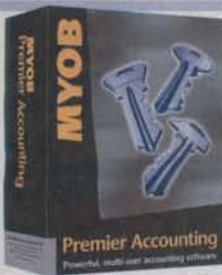
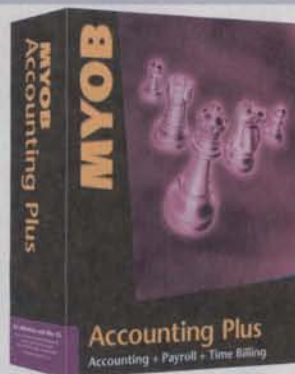
(85772) GST Inc: **\$480**

Suited to both service and inventory based businesses with 1-30 employees, MYOB Accounting Plus maintains MYOB Accounting's ease-of-use and extends the functionality to include:

- Fully integrated payroll
- Professional time billing module
- Includes OfficeLink
- BAS & GST READY

The fully integrated payroll feature automatically updates all related accounts the instant a pay is entered - with no tedious importing or exporting of data required.

Compatible with Win 95/98, NT 4.0, Mac OS 8.0.



MYOB Premier Accounting

(85773) GST Inc: **\$9285**

Includes all the features and functionality of MYOB Accounting Plus with the addition of:

- Powerful multi-user access - includes 3 user licenses, add more at anytime
- Enhanced inventory - flexible pricing matrix for different types of customers
- Effortlessly handles multiple currencies

Compatible with Win 95/98, NT 4.0, Mac OS 8.0.



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This bundle from Symantec is available for a limited time only, combines **Norton SystemWorks 2001** – which consists of best-of-breed, award-winning solutions that are designed to work together, so you can easily improve system performance, eliminate viruses, and remove unwanted files, **AND Norton Personal Firewall 2001** – to give you peace of mind that your PC is secure from intrusion by hackers and your privacy is protected. Also includes **Norton SystemWorks 2001 Retail Upgrade**: \$40 rebate coupon in box for previous customers of Norton SystemWorks, Norton AntiVirus, Norton Utilities, Norton CrashGuard, Norton CleanSweep or Norton Internet Security.


Bundle Pack

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\$150

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Norton AntiVirus 7.5 Small Business Solutions for 10 users

**NEW
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For small managed networks consisting of 1 server and up to 9 work stations, **Norton AntiVirus 7.5 Small Business Solution for 10 Users**, provides automated, centralised virus protection and management. Customers who purchase and register this product are eligible for 12 months Upgrade Insurance from Symantec. Additional server or workstation licences may be purchased through the **Symantec Value Licence Program**.

Platforms Supported:
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(B3129) GST INC

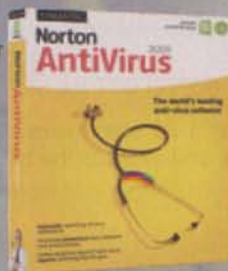
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Norton AntiVirus 2001 v7.0

Norton AntiVirus™ is the world's leading anti-virus software. It's always working in the background to protect your PC, and now it automatically updates its virus definitions when you're connected to the Internet.

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- Protects your privacy online.

What's New and Improved?
AntiVirus protection that is always up to date — **LiveUpdate 1.6** makes download faster all over the world, Smart scanning engine, Bootable CD for emergencies.


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Norton SystemWorks 2001 Professional Edition

This edition addresses the more sophisticated needs of the power user & small business owner. This suite offers all the tools in the standard edition, plus extra help with managing faxing & fax-on-demand needs, as well as system upgrading & backup tasks.

Includes:

- Norton AntiVirus 2001
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- Norton Web Services 2001
- Norton Ghost 2001
- WinFax 10.0 Basic Edition


 (A7647) GST INC **\$170**

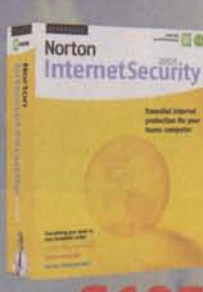
Norton AntiVirus 2001 (5 user pack)

Norton AntiVirus™ is the world's leading anti-virus software. Norton **AntiVirus 2001 Multi-user pack** provides essential virus protection for the small business to licence up to five workstations. It's always working in the background to protect your PC, and now it automatically updates its virus definitions when you're connected to the Internet. Don't let your company fall victim to viruses or other malicious internet code.


 (B2937) GST INC **\$239**

Norton Internet Security 2001 v2.5

This integrated security and privacy suite helps you defend your computer against hackers with **Norton Personal Firewall 2001**. You also get Symantec's award-winning **Norton AntiVirus 2001** software to stop viruses, malicious **ActiveX®** controls & Java programs, & other dangerous code. In addition, **Norton Privacy Control** lets you keep personal information from being sent to web sites without your permission, control Internet "cookies," & block banner ads to accelerate download speeds.


 (A8104) GST INC **\$105**
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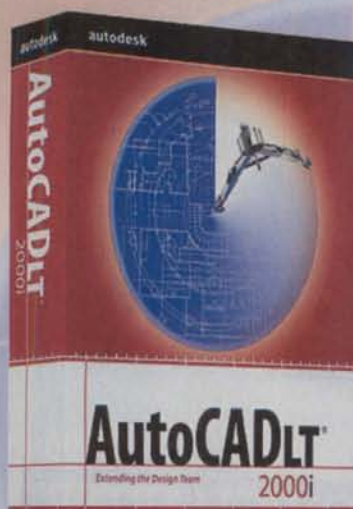
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UPGRADE: (A2793)

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Symbols 2000 Architectural

This professional collection of the most commonly used symbols can significantly improve your productivity by giving you a ready-made library of design elements. With the toolbar-style interface, find any of the 5,600-plus symbols with only 2 mouse clicks, then place where you need.



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Symbols 2000 Engineering

Find any of the 10,800-plus symbols with only 2 mouse clicks, then place where you need. Electrical IEC, Electrical JIC, Mechanical DIN/ISO Library, Hydraulics, Pneumatics, Materials Processing and Ventilation, Electronics, Organizational and Planning Libraries.



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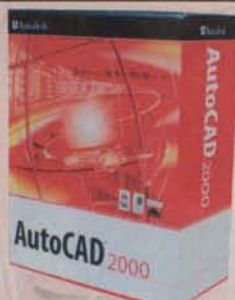
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Mechanical Desktop® Release 5, a major update of the world's best-selling solid modeler, unites 3D parametric features with the 2D AutoCAD® 2000 toolset and integrates with companion software to address every design-through-manufacturing process. The Power Pack version adds a parts library, a shaft generator, and engineering calculations.

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3D Studio Max: Professional 3D modelling and animation. Quickly create richly textured, high quality images and animations. Character Studio is an extension for 3D Studio MAX. For large-scale, professional character animation production. Create characters that move with amazing realism.

*Current student ID + course record needed to purchase. Course must be related to subject: graphic design/ animation & course must be longer than 12 months.

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Features comprehensive Microsoft Office and Visual BASIC for Applications v6 support, professionally designed templates for every business need, HTML output and network-enabled deployment.



(B4376) GST INC: **\$615**

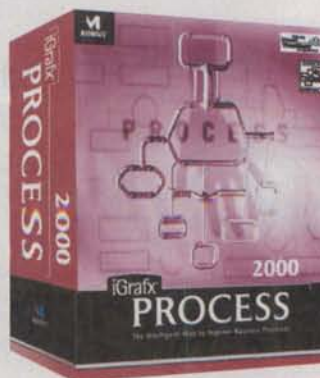
iGrafx[®] 2000 PROCESS

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New version of the best selling iGrafx Process! Powerful graphical process diagramming, modelling and simulation capabilities.

New version now includes full copy of iGrafx FlowCharter 2000 Professional and iGrafx OrgCharter. Also includes Auto-Layout feature, improved simulation algorithms and timetable generator. Process 2000 now allows for data to be imported into the process simulation from 'real world systems' with minimal customisation. Integrated process diagramming, simulation and analysis features make iGrafx Process 2000 the ultimate tool for process improvement. Allows 'What If?' scenarios and resource and cost analysis. Features Microsoft Office compatibility, HTML support, Visual BASIC for Applications v6 extensibility and more.



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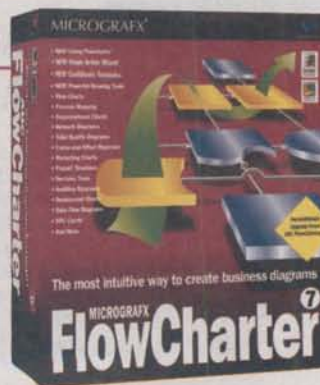
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The most intuitive way to create business diagrams

Visually communicate ideas, information and data using this best-selling software

FlowCharter 7.0 creates incredibly powerful, interactive diagrams of just about everything imaginable – business processes, workflows, computer networks, web sites, database structures and much more.

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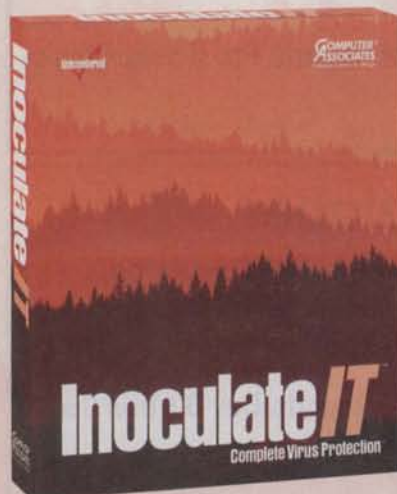
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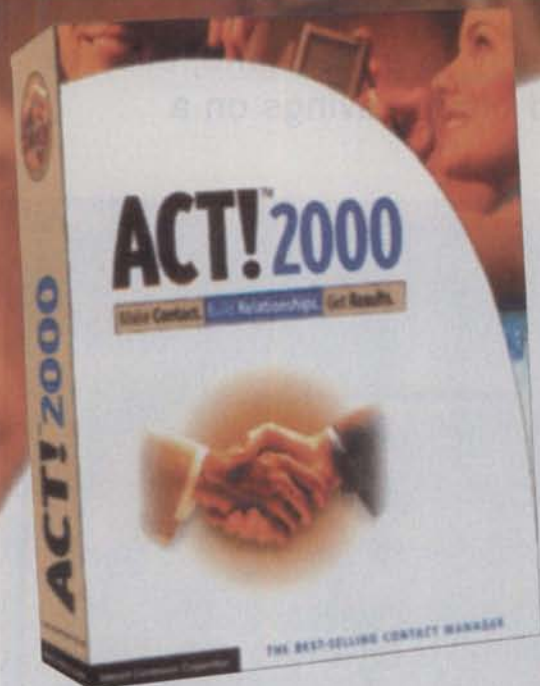
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Excel 2000	✓	✓	✓	✓	✓
Outlook 2000	✓	✓	✓	✓	✓
Powerpoint 2000	✓		✓	✓	✓
Publisher 2000		✓	✓	✓	✓
Small Business Tools		✓	✓	✓	✓
Access 2000			✓	✓	✓
FrontPage 2000				✓	✓
PhotoDraw 2000				✓	✓
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- FrontPage 2000
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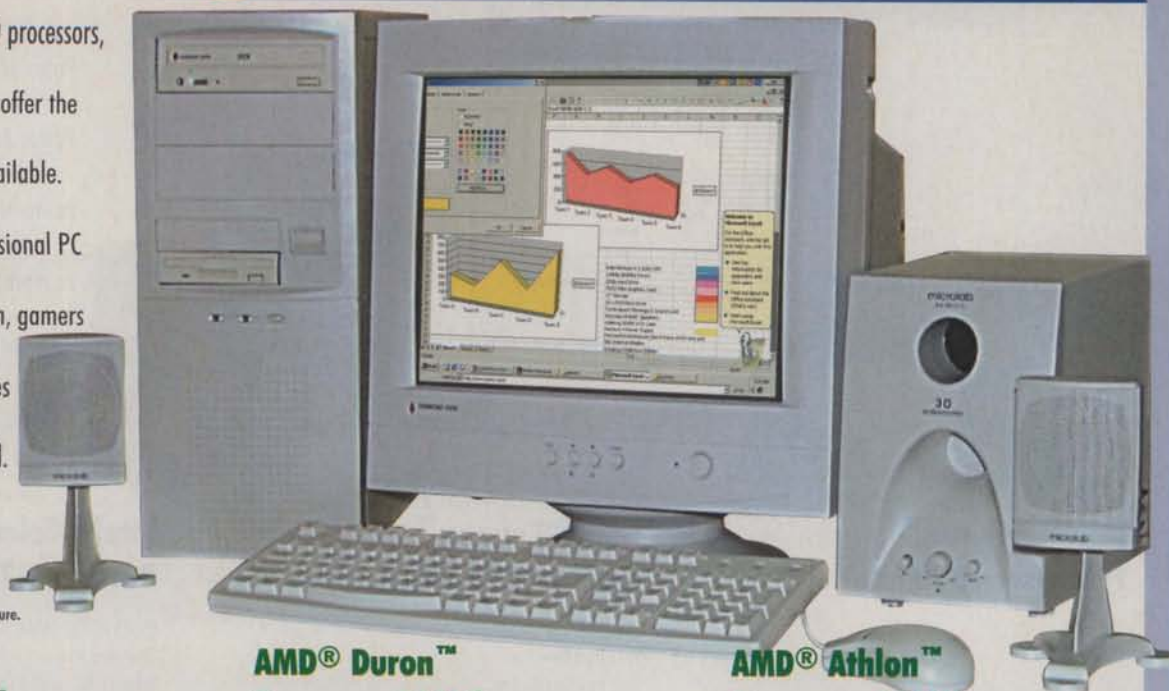
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Connect up to 7 SCSI devices and gain great performance by moving to SCSI with the Adaptec 2906. Run your ZIP drive or Scanner up to 6 times faster than with a parallel port connection. Adaptec EZ-SCSI Software is included to help you manage your peripherals.



CC9EN021 **\$125**

ADAPTEC 29160
SCSI CARD

The Adaptec 29160 SCSI Card is tailored to the needs of small multi-user work group servers and powerful workstation users. This PCI card gets the most out of high-performance Ultra160 SCSI internal hard drives and the widest selection of popular external SCSI devices.



29160N 32-Bit PCI 29160 64-Bit PCI
\$625 **\$659** CC9AD003

EASY CD CREATOR 4
DELUXE

Easy CD Creator 4 Deluxe goes way beyond the software that came with your CD-Recorder, and all earlier deluxe editions. Now it's easier than ever to create music, photo, video, and data CDs.



\$139 SWAD000

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"Industry standard reliable & affordable backup power solution"

Back-UPS - Best Value power protection for your PC

- Compact Design
- Protect your PC, Monitor, Laser printer with 1 device
- Full-time EMI/RFI filters for noise filtration
- Lightning and surge suppression to protect your hardware
- Support for up to 4 Devices



Description	Price	Code
Back-UPS 500VA	\$229	PSAPC000
Back-UPS 300VA	\$139	PSAPC008
Back-UPS 650VA	\$259	PSAPC009

Smart-UPS - Power Management for advanced networks

- Full-time Surge Suppression and Noise Isolation
- User replaceable, hot swappable batteries
- Software configurable features, data logging on 1000/700 model
- Site-wiring fault indicator

Description	Price	Code
Smart-UPS 420VA	\$395	PSAPC010
Smart-UPS 620VA	\$525	PSAPC011
Smart-UPS 700VA	\$699	PSAPC003
Smart-UPS 1000VA	\$1015	PSAPC005

Power Supplies

Description	Price	Code
200W AT POWER SUPPLY	\$35	PSGEN000
230W ATX POWER SUPPLY	\$39	PSGEN002
300W ATX POWER SUPPLY	\$75	PSGEN003
350W ATX POWER SUPPLY	\$99	PSGEN011
300W P4 ATX POWER SUPPLY	\$99	PSGEN012
350W P4 ATX POWER SUPPLY	\$115	PSGEN013
300W Redundant ATX POWER SUPPLY	\$449	PSGEN014



Case

ADELONG DELUXE MINI CASE AT

W: 180mm
D: 340mm
H: 390mm
Power Supply: 230W ATX

\$45

CAADE000



ADELONG ATX CASE AT/ATX

W: 200mm
D: 450mm
H: 410mm
Power Supply: 250W ATX

\$55

CAADE014



DELUXE AT/ATX 250 WATT DESKTOP CASE

W: 442mm
D: 473mm
H: 155mm
Power Supply: 250W ATX

\$85

CAADE012



ADELONG 6000PATX CASE

W: 180mm
D: 445mm
H: 420mm
Power Supply: 300W ATX

\$135

CAADE018



ADELONG 6016 ATX CASE

W: 180mm
D: 445mm
H: 420mm
Power Supply: 250W ATX

\$79

CAADE021



ADELONG 6013 ATX CASE

W: 180mm
D: 445mm
H: 420mm
Power Supply: 250W ATX

\$79

CAADE025



ADELONG 4010 ATX CASE

W: 200mm
D: 482mm
H: 418mm
Power Supply: 250W ATX

\$79

CAADE028



CPU FAN



\$29

MSADE017

CASE FAN



Distance between screw holes
80mm
90mm

\$15

MSADE010

MOBILE RACK



ATA/66

\$29

MSADE020

EIDE

\$25

MSADE000

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Sales Hotline 02 8344 3190



Upgrade your old system with

From basic users wishing to prolong the life of their PC, to power hungry gamers and

multimedia enthusiasts, Adelong Computers have an upgrade bundle to suit. Choose

from over 50 upgrade bundles online, from a simple overhaul to suit your needs.

Desktop Upgrade Bundle

A low cost upgrade for workstations and home computers.

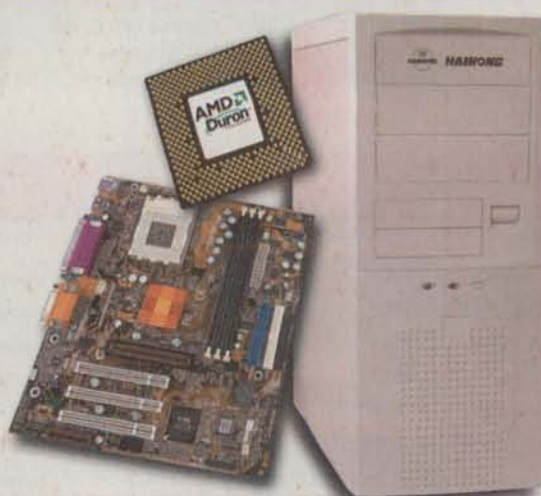
- AMD Duron 700Mhz CPU
- Gigabyte GA-7ZM Mainboard
- Adelong ATX Tower Case
- Intel Celeron 633Mhz CPU
- Gigabyte GA-6VXE7+ Mainboard
- Adelong ATX Tower Case

\$439*

SPADE006

\$419*

SPADE011



Power Upgrade Bundle

Upgrade to the latest in performance for a fraction of the cost of a new PC.

- AMD Athlon 1Ghz CPU
- MSI K7T PRO 2A Mainboard
- 128Mb PC-133 SDRAM
- Adelong 6000P ATX Tower Case
- Intel Pentium III 1.1Ghz CPU
- MSI K7T PRO 2A Mainboard
- 128Mb PC-133 SDRAM
- Adelong 6000P ATX Tower Case

\$915*

SPADE047

\$1015*

SPADE052



Gamer Upgrade Bundle

High framerate performance upgrade for the serious gamer.

- AMD Athlon 1Ghz CPU
- Gigabyte GA-7ZX Mainboard
- Hercules 3D Prophet II GTS Pro
- 128Mb PC-133 SDRAM
- Adelong 6016 ATX Tower Case
- AMD Athlon 1.2Ghz CPU
- Gigabyte GA-7ZX Mainboard
- Hercules 3D Prophet II GTS Ultra
- 128Mb PC-133 SDRAM
- Adelong 6016 ATX Tower Case

\$1,609*

SPADE058

\$2,039*

PADE063



*Prices and specifications subject to change without notice

an Adelong Upgrade Bundle

Alternatively you can call or email our sales staff for a quotation on the upgrade

bundle that you need. All upgrade bundles include both a power supply and

CPU fan and are shipped unassembled. Pre-assembly is available upon request.

Audio Upgrade Bundle

Turns your PC into a high quality recording studio.

- | | |
|---|---|
| <ul style="list-style-type: none"> • AMD Athlon 1.1Ghz CPU • Gigabyte GA-7ZX Mainboard • Guillemot Maxi Studio ISIS XL Soundcard • 128Mb PC-133 SDRAM • Adelong ATX Tower Case | <ul style="list-style-type: none"> • Intel Pentium III 933Mhz CPU • Gigabyte GA-6VXE7+ Mainboard • Guillemot Maxi Studio ISIS XL Soundcard • 128Mb PC-133 SDRAM • Adelong ATX Tower Case |
|---|---|

\$1,639*

\$1,959*

SPADE067

SPADE072



Video Upgrade Bundle

From home movie, to Professional Broadcast Quality editing.

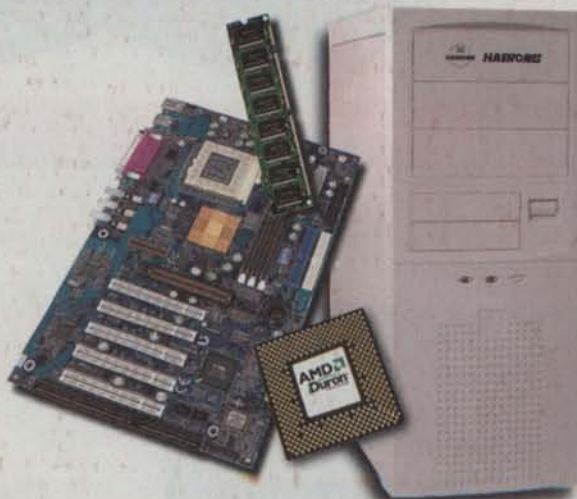
- | | |
|---|---|
| <ul style="list-style-type: none"> • Intel Pentium III 866Mhz CPU • Gigabyte GA-6VX7-1394 Mainboard • 128Mb PC-133 SDRAM • IEEE-1394 Firewire Digital Video Capture • Adelong ATX Tower Case | <ul style="list-style-type: none"> • AMD Athlon 1Ghz CPU • Gigabyte GA-7ZX Mainboard • Matrox RT2000 Analogue/DV Capture Card with Bundled G400 Display Card • 128Mb PC-133 SDRAM • Adelong ATX Tower Case |
|---|---|

\$1,015*

\$3,455*

SPADE077

SPADE082



Ultimate Upgrade Bundle

The power and bandwidth to perform any task easily.

- | | |
|---|--|
| <ul style="list-style-type: none"> • Intel Pentium 4 1.4Ghz CPU • Gigabyte GA-8TX Mainboard • 128MB 800MHZ RDRAM • Adelong 6000P ATX Tower Case | <ul style="list-style-type: none"> • Intel Pentium 4 1.4Ghz CPU • Gigabyte GA-8TX Mainboard • Guillemot 3D Prophet II GTS Ultra • 128MB 800MHZ RDRAM • Adelong 6000P ATX Tower Case |
|---|--|

\$2,945*

\$3,915*

SPADE086

SPADE087



*Prices and specifications subject to change without notice

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Adelong Computers

The award winning series of Satellite notebook PC's offer the ideal balance in affordability and performance. Every Satellite is built with the right mix of features to help you power through your day-to-day computing requirements. Whether for business or pleasure, the Satellite range is the perfect choice to take you into the new world.

Satellite 2250CDT

Intel Celeron 600Mhz
64MB Ram (Max 192MB)
6GB Hard Drive
Internal CD-Rom
Internal Fax Modem
12.1" TFT Screen
Windows 98SE

\$2,835

NBT05085



Satellite Pro 4320XDVD

Intel Pentium III 600Mhz
64MB Ram (Max 320MB)
12GB Hard Drive
Internal DVD-Rom
Internal Fax Modem
14.1" TFT Screen
Windows 98SE

\$3,929

NBT05081



Tecra 8100 Speed Step

Intel Pentium III 750Mhz
128MB Ram (Max 512MB)
20GB Hard Drive
Internal DVD-Rom
Internal Fax Modem
14.1" TFT Screen
Windows 98SE

\$7,399

NBT05087



Gaming

PS2™
PlayStation.2



Playstation 2 console

\$749

SYSON000

8Mb memory card

\$65

10SON007

PSone™

\$179

SYSON008



1Mb memory card

\$19

10SON009



Dual shock controller 2

\$59

10SON006



PlayStation II Games



Ridge Racer v

\$89

SWSON001



Tekken tag tournament

\$89

SWSON000

CALL OUR SALES TEAM FOR THE LATEST PRICING ON THESE PRODUCTS

Intel Celeron Processor

Get great performance for your personal computing and office needs with the Intel Celeron Processors. Intel Celeron processors give you quick, responsive performance for today's business applications and provide cost-effective managed client solutions for any environment.

Model

Intel 633Mhz Celeron Processor FCPGA S370
Intel 667Mhz Celeron Processor FCPGA S370
Intel 700Mhz Celeron Processor FCPGA S370
Intel 733Mhz Celeron Processor FCPGA S370
Intel 766Mhz Celeron Processor FCPGA S370
Intel 800Mhz Celeron Processor FCPGA S370

Price	Code
\$199	CPINT057
\$209	CPINT058
\$225	CPINT060
\$285	CPINT061
\$389	CPINT062
\$399	CPINT065

**Intel Pentium III Processor**

The new range of Intel Pentium III Processors feature 256Kb of Advanced Transfer Cache - a mechanism which matches the cache speed to the speed of the processor. Available in 100Mhz and 133Mhz front side bus speeds.

Model

Intel 800Mhz Pentium III Processor 256K ATC FCPGA
Intel 850Mhz Pentium III Processor 256K ATC FCPGA
Intel 1Ghz Pentium III Processor 256K ATC Slot 1
Intel 800EB Pentium III Processor 256K ATC 133Mhz FCPGA
Intel 866Mhz Pentium III Processor 256K ATC 133Mhz FCPGA
Intel 933Mhz Pentium III Processor 256K ATC 133Mhz FCPGA
Intel 1Ghz Pentium III Processor 256K ATC 133Mhz FCPGA

Price	Code
\$489	CPINT052
\$599	CPINT055
\$1179	CPINT064
\$475	CPINT051
\$595	CPINT056
\$829	CPINT059
\$1179	CPINT063

**Intel Pentium 4 Processor**

The Intel Pentium 4 processor maximizes the performance of cutting-edge technologies such as digital video and online gaming, and has an innovative design capable of taking full advantage of emerging Web technologies.

**Model**

Pentium 4 Processor 1.4Ghz with SSE2 and MMX
Pentium 4 Processor 1.5Ghz with SSE2 and MMX

Price	Code
\$1739	CPINT064
\$2449	CPINT065

**AMD Athlon Processor**

This is the world's most powerful engine for x86 computing, as well as industry's first seventh-generation x86 microarchitecture. It is designed to power the next generation in x86 platforms. Professionals working with image processing, CAD and digital content creation will benefit from the superior processing power of the Athlon Processor. Computing enthusiasts who want the highest performance to run the latest 3D games and multimedia will demand desktop powered by the Athlon Processor.

Model

AMD Athlon™ Processor 800Mhz with 3DNow!™ Technology
AMD Athlon™ Processors 850Mhz with 3DNow!™ Technology
AMD Athlon™ Processors 900Mhz with 3DNow!™ Technology
AMD Athlon™ Processors 950Mhz with 3DNow!™ Technology
AMD Athlon™ Processors 1Gz with 3DNow!™ Technology
AMD Athlon™ Processors 1.1Gz with 3DNow!™ Technology
AMD Athlon™ Processors 1.2Gz with 3DNow!™ Technology

Price	Code
\$259	CPAMD037
\$295	CPAMD041
\$329	CPAMD038
\$369	CPAMD042
\$409	CPAMD039
\$509	CPAMD043
\$579	CPAMD044

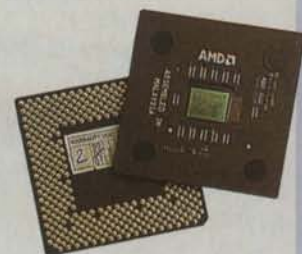
**AMD DURON Processor**

Employing all the benefits of its innovative design, the AMD Duron processor meets the requirements of today's most demanding value-conscious buyers without compromising their budget. With a sophisticated cache architecture, high speed system bus and superscalar floating point unit, the AMD Duron offers a 25% increase in performance over its competitors. Please refer to our web page for the latest information on the AMD Duron processor and available platforms.

Model

AMD Duron™ Processor 700Mhz with 3DNow™ Technology
AMD Duron™ Processor 750Mhz with 3DNow™ Technology
AMD Duron™ Processor 800Mhz with 3DNow™ Technology

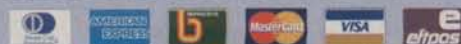
Price	Code
\$135	CPAMD035
\$155	CPAMD045
\$185	CPAMD046

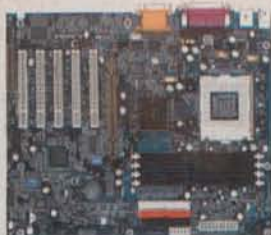


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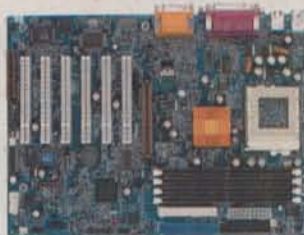




Gigabyte GA-8TX

- ◆ Intel 850 Chipset
- ◆ PGA 423 socket for Intel® Pentium® 4 processor
- ◆ 400MHz Front Side Bus
- ◆ 4 DIMMs up to 2GB PC800 RDRAM
- ◆ Creative CT5880 PCI sound
- ◆ UDMA ATA 100/66/33 IDE device
- ◆ 1 x AGP Pro, 1 x CNR, 5 x PCI slots

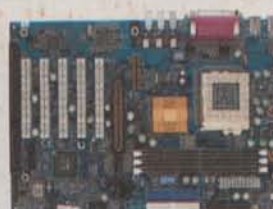
\$275 MBGIG043



Gigabyte GA-60XM7E

- ◆ Intel® 815E AGPset
- ◆ Socket 370 for Intel® FC-PGA or other processors
- ◆ 4 x DIMM sockets to 2Gb SD-RAM
- ◆ 1 x AGP 1 x CNR 6 x PCI slot
- ◆ 2 x Ultra DMA 33/66/100 IDE ports on board

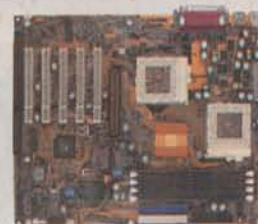
\$269 MBGIG035



GA-6VX7-1394

- ◆ VIA Apollo Pro Family AGPset
- ◆ Socket 370 for Intel® and other compatible processors
- ◆ 3 x DIMM to 1.5GB SDRAM
- ◆ 1 x AMR, 1 x AGP, 5 x PCI, 1 x ISA slot, 3 x 1394 I/O connectors
- ◆ 2 x Ultra DMA33/66 Bus Master IDE

\$255 MBGIG038



Gigabyte GA-6VXDC7

- ◆ VIA Apollo Pro Family AGPset
- ◆ Dual Socket 370 for Intel® FC-PGA Pentium® III and other compatible processors
- ◆ 4 x DIMM to 1.5GB SDRAM
- ◆ 1 x AGP, 5 x PCI, 1 x ISA slot
- ◆ 2 x Ultra DMA 33/66 bus master IDE

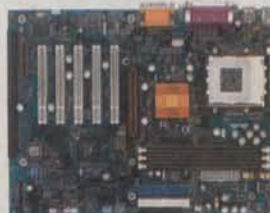
\$275 MBGIG039



Gigabyte GA-6VXE7+

- ◆ VIA Apollo Pro Family AGPset iTE 8671 I/Oset
- ◆ Socket 370 for Intel® and other compatible processors
- ◆ 3 x DIMM to 768MB SDRAM
- ◆ 1 x AGP, 5 x PCI, 2 x ISA slot
- ◆ 2 x Ultra DMA 33/66 IDE ports on board

\$175 MBGIG037



Gigabyte GA-7ZX

- ◆ VIA KT133/VIA VT82C686A Chipsets
- ◆ Socket A for AMD Athlon/Duron processors to 1.1GHz and faster
- ◆ Creative CT5880 PCI sound chip (4 channel audio) AC97 codec
- ◆ 3 x DIMM to 1.5GB SDRAM
- ◆ 1 x AMR, 1 x AGP, 5 x PCI, 1 x ISA slot
- ◆ 2 x Ultra DMA 33/66 bus master IDE

\$275 MBGIG040



Gigabyte GA-7ZM

- ◆ VIA KT133/VIA VT82C686A Chipset
- ◆ Socket A for AMD Athlon/Duron processors to 1.1GHz and faster
- ◆ Integrated AC97 Sound Card
- ◆ 3 x DIMM to 1.5GB SDRAM
- ◆ 1 x AMR, 1 x AGP, 3 x PCI slot
- ◆ 2 x Ultra DMA 33/66 bus master IDE ports on board

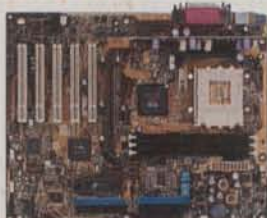
\$249 MBGIG041



Gigabyte GA-71XE4

- ◆ Supports AMD® -K7 Athlon™ & Duron™
- ◆ 200MHz Front Side Bus
- ◆ AMD® 751 (Irongate) North Bridge
- ◆ AMD® 756 (Viper) South Bridge
- ◆ 3 DIMM sockets for up to 768MB SDRAM
- ◆ 1 x AGP, 5 x PCI, 2 x ISA slots

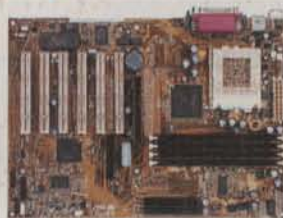
\$195 MBGIG044



ASUS A7V

- ◆ Via KT133 Chipset (VT8363 North and VT82C686A South Bridge)
- ◆ Supports AMD® Thunderbird™ / Duron™
- ◆ 3 DIMMs support for 1.5GB PC133/PC100/VCMI33 SDRAM.
- ◆ New PCI v2.2 and USB v1.1 standards
- ◆ Ultra DMA/100 and DMA/66 support
- ◆ 5 x PCI and 1 x AMR
- ◆ 200MHz Front Side Bus

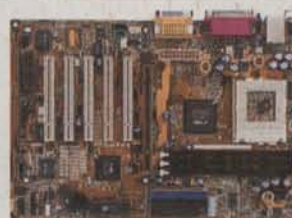
\$339 MBASU009



ASUS CUBX

- ◆ Supports Intel® Celeron™ 300MHz ~ 800+ MHz CPU.
- ◆ 4x DIMM sockets for 3.3V PC-100 SDRAM.
- ◆ Support 6 PCI and 1 AGP 2x slot
- ◆ 100/66MHz Front Side Bus
- ◆ UDMA/66 BM IDE Connector

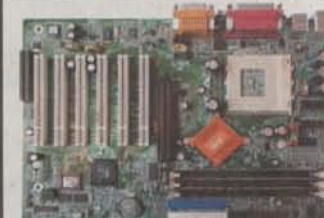
\$269 MBASU005



ASUS CUV4X

- ◆ Supports Intel Pentium® III/II Celeron, Katmai and Celeron™ processors
- ◆ 133MHz Front Side Bus and UltraDMA/66 IDE
- ◆ 1 x AGP Pro/4X, 5 x PCI, with an optional ISA, 1 x AMR
- ◆ 3x DIMM for up to 1.5GB PC133/SDRAM/PC100 (high speed)
- ◆ Wake on LAN and Modem

\$239 MBASU007



MSI K7T Pro 2A

- ◆ VIA KT133 chipset
- ◆ Socket A for AMD Athlon/Duron processor and supports 600MHz ~ 1.2GHz or higher
- ◆ 3 x DIMM to 1.5GB SDRAM
- ◆ 2 x IDE Controllers Supporting UDMA 33/66/100
- ◆ 1 AGP, 1 CNR, 6 PCI Expansion slots
- ◆ 2 serial ports; 1 parallel port; 4 USB ports; 1 IrDA, 1 Audio/Game port

\$249 MBMSU004

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Quantum

Quantum Fireball AS

- ♦ Ultra ATA/100
- ♦ 8.5ms Seek Time
- ♦ 7200 RPM

20GB **\$269** HDQTM084
30GB **\$325** HDQTM085
40GB **\$395** HDQTM086
60GB **\$535** HDQTM087

Quantum Fireball LCT20

- ♦ Ultra ATA/100
- ♦ 12ms Seek Time
- ♦ 5400 RPM

20GB **\$249** HDQTM088
30GB **\$275** HDQTM089
40GB **\$319** HDQTM090



Seagate

Seagate Barracuda III

- ♦ Ultra ATA/100
- ♦ 8.9ms Seek Time
- ♦ 7200 RPM

20GB **\$265** HDSGT047
30GB **\$329** HDSGT052
40GB **\$389** HDSGT057

Seagate U Series 5

- ♦ Ultra ATA/100
- ♦ 8.9ms Seek Time
- ♦ 5400 RPM

20GB **\$239** HDSGT054
30GB **\$265** HDSGT055
40GB **\$305** HDSGT056



IBM

IBM Deskstar GPX

- ♦ Ultra ATA/100
- ♦ 8.5ms Seek Time
- ♦ 7200 RPM

20GB **\$285** HDIBM046
30GB **\$329** HDIBM051
45GB **\$375** HDIBM048
60GB **\$625** HDIBM049
75GB **\$839** HDIBM050

IBM Deskstar GV

- ♦ Ultra ATA/100
- ♦ 9.5ms Seek Time
- ♦ 5400 RPM

20GB **\$235** HDIBM054
30GB **\$265** HDIBM055
40GB **\$305** HDIBM056



HITACHI

Hitachi 2.5" Notebook

- ♦ ATA/5 Enhanced IDE
- ♦ 12ms Seek Time
- ♦ 4200 RPM

6GB **\$289** HDHIT004
9GB **\$369** HDHIT009
12B **\$389** HDHIT007
20GB **\$545** HDHIT008



Memory

SDRAM

- ♦ 168 Pin DIMM Module
- ♦ For use with Cyrix, AMD K6-2/3 & Athlon, Intel Pentium IV/III & Celeron Processors

32MB PC100 SDRAM **\$65** RAGEN024
64MB PC100 SDRAM **\$85** RAGEN022
128MB PC100 SDRAM **\$139** RAGEN023
256MB PC100 SDRAM **\$605** RAGEN025

133Mhz SDRAM

- ♦ 133Mhz 168Pin DIMM Module
- ♦ Designed for use with Intel Pentium III Processors equipped with 133Mhz Front Side Bus
- ♦ Compatible with existing PC100 Mainboards

64MB PC133 SDRAM **\$65** RAGEN029
128MB PC133 SDRAM **\$125** RAGEN030
256MB PC133 SDRAM **\$629** RAGEN031

RAMBUS RAM

128mb 600MHZ ECC Rambus RIMM **\$685** RAGEN032
128MB 700MHZ ECC Rambus RIMM **\$699** RAGEN033
128mb 800MHZ ECC Rambus RIMM **\$769** RAGEN034
256MB 600MHZ Rambus RIMM **\$1335** RAGEN035
256MB 700MHZ Rambus RIMM **\$1429** RAGEN036
256MB 800MHZ Rambus RIMM **\$1535** RAGEN037

EDO RAM

- ♦ 32-bit Memory
- ♦ Use with 486 and older Pentium systems
- ♦ Used in Pairs in Pentium Systems

16MB EDO SIMM 72Pin **\$105** RAGEN005
32MB EDO SIMM 72Pin **\$209** RAGEN006

3D Prophet II GTS Ultra

- GeForce2 Ultra Processor
- 64MB DDR Ram
- 128-bit Memory Interface
- 230MHz Memory Clock (x2) operates at 460MHz
- 250MHz Core clock
- 350MHz RAMDAC
- 2 Giga Texels/second
- 31.25 million Triangles/sec
- TV-Out and DVI-Out
- 7.36GB/s Internal chipset bandwidth

GTS Ultra
\$989
DCGU010



3D Prophet II GTS Pro

- GeForce2 Pro Processor
- 64MB DDR Ram
- 128-bit Memory Interface
- 200MHz Memory Clock (x2) operates at 400MHz
- 200MHz Core Clock
- 350MHz RAMDAC
- 6.4GB/s Internal chipset bandwidth
- 1.6 Giga Texels/second
- 25 million Triangles/sec.
- TV-Out

\$715
DCGU011



3D Prophet II GTS

- GeForce2 GTS Processor
- 32/64MB DDR Ram
- 333MHz Memory Clock
- 200MHz Core Clock
- 1.6 Gigatexels per second

GTS 64MB
\$699
DCGU009

GTS 32MB
\$609
DCGU006



3D Prophet II MX Dual-Display

- GeForce2 MX Twin ViewT Processor
- 32MB Ultra Fast RAM
- VGA + TV Dual-Display support
- 128-bit Memory bus
- 183MHz RAM clock
- 175MHz Core clock
- 2.8GB/s Internal bandwidth
- 700 MegaTexels/second
- TV-Out

\$299
DCGU012
\$265
DCGU008



RT2000 Video Editing Card

- True THREE-LAYER realtime editing (Two video plus graphics)
- Realtime broadcast-quality 3D effects
- Realtime native DV and MPEG-2 editing
- Analog and digital video input/output
- MPEG-2 output
- Integrated Matrox Millennium Flex 3D Edition Display Card
- Stereo audio input/output genlocked to video ensures perfect lip-sync



\$2659
DCMAT041

Matrox G200 Multi Monitor

- Matrox G200 graphics chip
- Single PCI card for Dual or Quad output
- Up to 32 MB of memory
- 250 MHz RAMDAC for flicker-free displays
- 1800x1440 or 1920x1200 desktop per chip
- Support for up to 16 monitors



32MB Quad with TV Tuner
\$1745
DCMAT045
32MB Quad 16MB DualHead
\$1545 \$1109
DCMAT044 DCMAT043

The Marvel G400-TV

- 16MB SGRAM
- Matrox G400 256-bit DualBus graphics chip
- Integrated 300MHz UltraSharp RAMDAC
- Hardware-MJPEG video capture and editing
- TV tuning with fully programmable PC-VCR Remote
- Superior DVD playback and software DVD player
- MJPEG to MPEG2 conversion software
- Audio, Video and TV connection with Marvel connector box



\$735
DCMAT038

Matrox Millennium G450

- 0.18-micron technology
- 256-bit DualBus architecture
- 64-bit Double Data Ram
- Matrox's DualHead Display allows support of any two of the following displays:
- monitor, TV
- analog flat panel, digital flat panel
- 32-bit Z-buffer including 8-bit stencil buffer
- 360MHz primary RAMDAC



16MB 32MB
\$269 \$365
DCMAT043 DCMAT040

Cougar Video Edition

- Complete Solution for Home Video Editing
- NVIDIA TNT2 M64 chipset
 - 32MB RAM
 - 125MHz Core Clock
 - 300MHz Ramdoc
 - 128-bit 3D processor
 - 8.3 million triangles/sec
 - 250 million texture-mapped pixels/sec



PCI AGP
\$275 \$275
DCGU004 DCGU005

TNT2 M64 Display Card

- 128-bit Graphic Engine
- 64-bit Frame Buffer
- 32Mb Ram
- 300MHz Ramdoc
- 24-bit Z Buffer



AGP
\$149
DCPRO002

AGP TV OUT
\$165
DCPRO003

PCI TV OUT
\$165
DCPRO004

GeForce2 MX

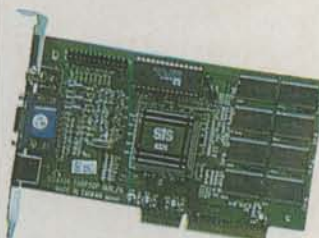
- nVIDIA 2nd Generation 256-bit GeForce2 MX GPU.
- Integrated 2ND-generation T&L engine.
- 700-Mtexels Fill Rate.
- 20M triangles/sec setup.
- Independent Full Scene Multisample Anti-aliasing.
- 32-bit color with 32-bit z/stencil.
- DirectX and S3TC texture compression

AGP TV OUT
\$205
DCEAG009

AGP TV OUT
\$219
DCEAG010

8MB AGP

The Magic 8MB AGP Graphics Accelerator is ideal for budget upgrades.



\$65
DCPRO002



Turtle Beach SonicFury

Six channel DSP audio accelerator SonicFury is the revolutionary high-performance six-channel DSP sound card that brings a new level of processing power and audio fidelity to your PC.



Includes:

- Cirrus Logic Crystal 4630 Audio Processor
- 64 voice hardware wavetable engine.
- 8MB DLS synthesizer
- Scalable DSP/Host load sharing.
- 64-voice hardware/1024 software voice.
- Dual AC-97 2.1 audio codecs with hardware full-duplex
- 18-bit A/D converters
- 20-bit D/A converters

\$295

MMTUR007

Portable MP3 Players

Dragon State

Portable MP3-CD Player

Plays MP3 CD's up to 12 Hours of Music Per CD. Audio CD's, CD-R's 50 second Anti-Shock protection System.



\$215

MMTUR008

Includes:

- Built in rechargeable circuit for recharging batteries
- DBBS, Dynamic Bass Boost System
- Stereo Headphone Jack and Headphones
- Line Out Jack
- DC Power Socket
- Digital LCD Function Display. Displays Mp3 Tracks
- Recording Function: 500 sec recording capacity with ALC Control.
- 50 second Anti-Shock Control

CREATIVE

Nomad II MP3 Player



Compact, shock-proof and designed for crystal clear, skip-free digital audio, NOMAD II is a perfect complement to your active lifestyle. The NOMAD II is upgradable, offering MP3 currently but also allows you to upgrade to WMA or other codecs in the future. With a 64MB flash memory card, you can enjoy hours of audio and voice recording. It also has a built-in FM tuner with 32 presets.

Description

Nomad II MG 64MB MP3 Player

Nomad II MG Docking Station

Price

\$755

\$65

Code

MMCRE061

MMCRE068

Portable MP3 Players

NOMAD JUKEBOX

Enjoy over 100 hours of CD-quality music from the NOMAD Jukebox. With its 6GB storage capacity, NOMAD Jukebox allows you to store up to 150 CDs of digital music in a compact, portable design that comes in metallic silver or metallic blue.



NEW

\$949

MMCRE063

Sales Staff are Available (est)

9am-6pm Monday to Friday,

10am-4pm Saturday

Technical Support

(5 Days a week 9am-5.30pm)

Phone (02) 8344 3160

Sales Hotline 02 8344 3190



Adelong Computers

Guillemot Maxi Studio ISIS XL



Maxi Studio ISIS XL allows for eight simultaneous inputs and four independent outputs in full-duplex so users can record up to eight different musicians live. The Maxi Studio ISIS XL is an unprecedented stand-alone professional quality studio soundcard that includes an amazing GM/GS synthesizer with 4MB RAM of high quality sounds and a professional stereo multi-layer sampler so home musicians can fulfill their wildest musical dreams.

External audio rack that gathers 1/4" jack connectors for unparalleled analog recording and playback 32, 44.1 or 48 KHz S/PDIF input and output in both gold-plated RCA and optical format for digital transfers with a DAT or a mini-disc.

- External 20-bit converters
- DIN in/out/through connector
- 4 selectable hardware synchronization clocks
- 2 MIDI ports
- Virtual control console to adjust monitoring and i/o levels
- Higher bandwidth allows enhanced multi-track recording capabilities
- Sampling memory expandable to 36 MB

\$685 MMG0001

Guillemot Maxi Sound Fortissimo XL

- YAMAHA audio processor.
- 2 or 4 Speaker Support.
- Optical Digital Output
- 16-bit, mono/stereo 4kHz to 48kHz
- True full duplex recording and playback with different sampling rate.
- Supports all open standards
- Built-in Yamaha XG synthesizer (with 2MB MIDI hardware wavetable)



\$85 MMG0002

Guillemot Maxi Sound Muse



- New generation CMI-8738 Audio processor
- CD and Pro Audio quality
- 16-bit mono/stereo 4kHz to 48 kHz in full duplex
- Compatible with Microsoft DirectSoundT, DirectMusicT and DirectX® Audio
- Yamaha XG studioT- GMT(General MIDI) and Yamaha XG compatible
- 676 instrument sounds and 21 drum kits
- Effects : reverb and chorus

\$65 MMG0003

Turtle Beach Montego II

- 18-bit ADC and DAC Audio Converter
- Better than 97dB Signal to Noise
- 100 Hz (-89dB); 1kHz (-90 dB); 10 kHz (-87 dB) Hardware Stereo Crosstalk
- 20 Hz - 20 kHz Frequency Response (+/-1 dB)
- Sampling Rates up to 48kHz in 1Hz steps.
- 96 hardware digital mixers
- 96 hardware-based sample rate converters
- 320 voice advanced wavetable synthesis (64 hardware + 256 hardware accelerated software)
- 4MB instrument samples stored in PC system RAM using dynamic caching
- Hardware-based MPU-401 MIDI UART-compatible interface



\$65 MMG0005

Creative SoundBlaster Live Platinum



- EMU 10K1 Synthesizer Chip
- Synthesizer Type Wavetable (Scalable PCI)
- Up To 32MB RAM Based on System RAM
- 48 MIDI Channels
- Full Duplex

\$479 MMG0004S

Creative SoundBlaster Live Value



- 16-bit Max. Recording Depth
- 48 KHz Max. Recording Rate
- 16-bit Max. Playback Depth
- 48 KHz Max. Playback Rate
- Signal-to-Noise Ratio > 96 dB

OEM **\$115** MMG0003B

Four Point Surround FPS2000 Digital

A powerful surround system with four discrete satellite speakers and a powered subwoofer, Four Point Surround FPS2000 Digital is the speaker system of choice for power gamers.



\$459 MMCRE065

Creative SoundWorks Speaker

Taking advantage of a room's acoustics, Creative SoundWorks speakers deliver high-quality, wide-range, big sound that compares favorably with component systems costing far more. Connect it to anything with a headphone jack for beautiful high-fidelity sound, including great bass.



\$195 MMCRE066

PCWorks Four Point Surround FPS1000

Get ready for the real 3D audio surround gaming experience with the FPS1000. With four compact amplified satellite speakers, separate subwoofer, two rear stands and the single master volume control, FPS1000 is the first complete four-channel speaker system for the PC.



\$189 MMCRE033

120W Stereo Speakers

- 120 Watt PMPO Power Output
- 2 x 3" Full Range Drive Units
- 100Hz to 20KHz Frequency Response
- Magnetically Shielded



\$15 MMGEN007

ALTEC LANSING ACS22 Tower Speaker

Powerful sound from a two tower system. Ideal for those consumers who need excellent PC audio output, either for teleconferencing, games or music CDs, but who do not have a requirement for a subwoofer. Excellent value for money.

- Small footprint with headphone output
- 5 Watts RMS Power
- Produces powerful audio output from two satellites



\$75 MMALTO08

ALTEC LANSING ACS45.1 PowerCube Speaker

Proven Sonic Performance at an amazing price. Introducing the Altec Lansing ACS45.1 PowerCube Speakers, a three piece multimedia audio solution at an unbelievable price. Experience the enhanced output of the PowerCube satellite system. Great for games and CD's, the ACS45.1 will bring hi-fi audio to your computer desktop today.

- 12 Watts Satellite Power
- 3" full range driver
- 20 Watts RMS
- 6" subwoofer



\$215 MMALTO03

ALTEC LANSING ACS54 PowerPlay Plus Speaker

5-Piece system designed especially for the sound demands of gamers. PowerPlay Plus is the only speaker system designed especially for gamers that provide high quality, powerful surround sound game audio output. This 5-piece system provide a true multidimensional surround sound experience

- 20 Watts Satellite Power
- 20 Watts Subwoofer Power
- Unique Bracket/stands provide convenient mounting possibilities for surround speaker



\$265 MMALTO09

ALTEC LANSING ACS33 PowerCube Speaker

3-Piece system dramatically enhances PC Audio. The PowerCube Speaker system with its compact satellites delivers powerful audio playback from a 3-piece system. Active subwoofer can be set for desired bass response and the electronic controls on the satellites adjust the volume for both satellites and subwoofer simultaneously.

- 10 Watts Satellite Power
- Volume control and Power ON L.E.D
- 15 Watts Subwoofer Power



\$129 MMALTO05

Microlab M-400E Speakers

The Microlab M-400E Slimline Speakers are designed for small workspaces, while maintaining high quality sound output.

- 36 Watt RMS
- 3" satellite driver
- 4" woofer driver
- 35Hz - 18KHz Frequency Response



\$85 MMMIC000

Microlab M-400P Speakers

Designed to be as unobtrusive as possible, the Microlab M-400P Flat Panel Satellites can be wall mounted and can be fitted with photographs while maintaining audio quality.

- 36 Watt RMS
- Flat speaker satellites
- 4" woofer driver
- 35Hz - 18KHz Frequency Response



\$95 MMMIC001

Microlab M-800C Speakers

Microlab M-800C Speakers offer the big bass performance of a 3-piece system at the price of a 2-piece system.

- 40 Watt RMS
- 3" satellite driver
- 5.25" woofer driver
- 35Hz - 18KHz Frequency Response



\$75 MMMIC002

Microlab M-800B Speakers

The Microlab M-800B 4.1 Speakers offer incredible surround sound performance at an affordable price.

- 48 Watt RMS
- 3" satellite driver
- 5.25" woofer driver
- 35Hz - 18KHz Frequency Response



\$115 MMMIC003

Sales Staff are Available (est)
9am-6pm Monday to Friday,
10am-4pm Saturday

Technical Support
(5 Days a week 9am-5.30pm)
Phone (02) 8344 3160

Sales Hotline 02 8344 3190



***AUSTRALIA WIDE 3 YEAR ON SITE WARRANTY**

Mitsubishi DV151 15" LCD TFT Display



- 15" TFT-LCD Monitor
- Display size 307.2(H) x 230.4(V)mm
- Pixel pitch 0.30(H) x 0.26(V)
- Resolution 1024(H) x 768(V)
- Weights 6kg.

Boasts the same effective screen area as a 17" monitor

\$1749 MOMIT018

Mitsubishi DV180 18" LCD TFT Display



- 18.1" MULTIMEDIA TFT-LCD Monitor
- Display size 359(H) x 287.2(V) mm
- Pixel pitch 0.2805(H) x 0.2805(V) mm
- Resolution 1280(H) x 1024(V)
- Weights 9.8kg.

Boasts the same effective screen area as a 19" monitor

\$5095 MOMIT017

Mitsubishi CD-RW Drives

Diamond Data CD-RW Drives 30x6x4 / 30x8x4



- Buffer: 2MB (30x6x4)/8MB(30x8x4)

Pack includes:

- CD-RW Drive
- 1x CD-RW Disk
- Easy CD Creator™
- Director™
- CD Copier Deluxe™
- Audio Cable & Screw

32x8x4x **\$285** MOMIT011
32x10x4 **\$375** MOMIT014

Mitsubishi DVD-ROM



16X (21 600 KB per second) Data Transfer Rate from DVD-ROM discs
40X (6 000 KB per second) Data Transfer Rate from CD-ROM discs
Includes Cyberlink PowerDVD Playback Software for DVD, Audio and MP3 Reads
DVDs and CDs as well as Recordable DVD and CD formats
Plug and Play Installation Low Vibration Mechanism

16x DVD-ROM **\$209** MOMIT008

Mitsubishi Voice Modems

Diamond Voice modems are an ideal choice for internet, data telephone answering and fax applications. They provide support for the unified V.90 standard as well as K56flex, giving a maximum download speed of 56 Kbps*.



External **\$95** MOMIT002
Internal **\$49** MOMIT003

Mitsubishi CD-ROM Drives



DIAMOND DATA CD-ROM Drives are Multi Read Compliant, support Ultra DMA data transfers and employ advanced Constant Angular/Linear Velocity for improved reads and transfers.

50x

50x EIDE CD-ROM **\$75** MOMIT005
48x EIDE CD-ROM **\$65** MOMIT012

Mitsubishi Diamond View Scanners

DV648U

DV648U 600 dpi Flatbed Scanner with USB Interface. Ideal for home and office use. Scans pages and photographs quickly and easily with an optical resolution of up to 600 x 1200 dpi. The DV648U is easy to install, thanks to its USB interface.



DV648U **\$115** MOMIT003

DV648UT

DV648UT - Transparency and Film Scanning, with USB Interface and 600 dpi optical resolution. A added advantage of being able to scan positive or negative films, slides and other transparent objects. Film frames, a slide holder and a 35 mm film strip holder is included.

DV648UT **\$235** MOMIT004

Mitsubishi Diamond View Scanners

DV1248VT

The 1200 x 2400 dpi resolution and high dynamic colour range of the DV1248ST make it ideal for high-end business and graphics applications. Scans transparencies and film up to 254 x 200 mm as well as pages, photographs and documents up to 356 x 216 mm.



Features:

- 1200 x 2400 dpi optical resolution (19200 x 19200 max)
- 36 bit CCD image sensor 36 bit colour
- TWAIN compliant
- 48 bit Windows software colour enhancement

DV1248ST **\$945** MOMIT005

***AUSTRALIA WIDE 3 YEAR ON SITE WARRANTY**

Mitsubishi Diamond View 1554e 15"

- 15" Monitor ideal for home users
- Dynamic Focus picture tube
- 13.9" Viewable, 0.28 dot pitch
- Max Resolution 1024 x 768 @65Hz
- Weighs 12.5kg



\$265 MOMIT009

Mitsubishi Diamond View 1570i 15"

- 15" Monitor ideal for SOHOs
- Dynamic Focus picture tube
- 13.9" Viewable, 0.28mm dot pitch
- Max Resolution 1280 x 1024 @60Hz
- On Screen Display
- Weighs 12.5kg



\$309 MOMIT010

Mitsubishi Diamond View 1770f 17"

- 17" Monitor for daily users
- High Contrast CRT
- 15.9" Viewable, 0.27mm dot pitch
- Max Resolution 1280 x 1024 @60Hz
- On Screen Display
- Weighs 17.4kg with OSD



\$379 MOMIT014

Mitsubishi Diamond View 1772if 17"

- 17" Monitor
- 15.9" Viewable, 0.26mm dot pitch
- Max Resolution 1280 x 1024 @60Hz
- On Screen Display
- Weighs 17.4kg



\$485 MOMIT019

Mitsubishi DV 170 LCD TFT Display

- 17" TFT-LCD Monitor
- Display size 307.2(H) x 230.4(V)mm
- Pixel pitch 0.30(H) x 0.26(V)
- Resolution 1024(H) x 768 (V)
- Weighs 6kg,



\$3259 MOMIT020

Mitsubishi Diamond View 17NF 17"

DIAMONDTRON NF
NATURAL FLAT CRT TECHNOLOGY

- 17" Natural Flat Monitor
- 16" Viewable image
- Distortion - free flat screen
- 0.25mm stripe pitch
- Max Resolution 1600x1200 @ 75Hz
- Weighs 19.2kg,



\$595 MOMIT015

Mitsubishi Diamond View 19NF 19"

DIAMONDTRON NF
NATURAL FLAT CRT TECHNOLOGY

- 19" Natural Flat Monitor
- 18" Viewable image
- Distortion - free flat screen
- 0.25mm stripe pitch
- Max Resolution 1600x1200 @ 85Hz
- Weighs 28.2kg,



\$1045 MOMIT016

Mitsubishi Diamond View 2107 21"

- 21" Monitor for professionals
- 20" Viewable, 0.26mm dot pitch
- Max Resolution 1600 x 1200 @85Hz
- Weight 30kg
- On Screen Display
- BNC & 15Pin Input



\$1675 MOMIT006



107T 17" Real Flat Monitor



\$539

MOPH1004

- For use with MAC and PC
- Autoscan offers flicker free display up to 1280 x 1024 @ 71 kHz or 1024 x 768 @ 89 Hz
- Real Flat High Contrast CRT with high resolution 0.25 mm dot pitch
- LightFrame™ for brightest and sharpest display of movie and photo windows
- XSD- Xtra Space Design™ for large screen display in a small footprint: maximum depth of only 419 mm / 16.5"

109P20 19" Real Flat Monitor



- Autoscan Technology, offering up to 1920 x 1440 @ 111kHz
- Real Flat Aperture Grille CRT with 0.24mm Grille Pitch
- Worlds shortest 19" footprint at 438mm depth
- PC and Mac compatible

\$1,065 MOPH1005

201P10 21" Real Flat Monitor



- Autoscan Technology, offering up to 2048 x 1536 @ 121kHz
- Real Flat Aperture Grille CRT with 0.24mm Grille Pitch
- Worlds shortest 21" footprint at 466mm depth
- PC and Mac compatible

\$1,795 MOPH1006

140S 14" LCD Monitor



- Analog video interface with advanced one touch AUTO adjustment for full compatibility with standard video cards
- Most compact design 165mm depth with cable management
- Less than 60% foot print of comparable CRT monitors

\$1,695 MOPH1007

150P 15" Brilliance LCD



- 60% smaller footprint-only 165mm deep
- Dual input-Accepts both DVI Digital and VGA input
- Advanced AUTO adjustment automatically optimises picture quality
- Built-in, front-firing stereo speakers and microphone for video conferencing and multimedia applications

\$1,895 MOPH1008

170B 17" LCD Monitor



- Dual input-accepts both DVI Digital and VGA input
- Advanced AUTO adjustment automatically optimises picture quality
- Wide viewing angle technology
- 181 mm footprint with full detachable cables

\$3,695 MOPH1009

Speakers

A1.2 Fun Power

- 2 x 1.5 watts RMS speakers for connection to a stereo sound card, CD/cassette/MP3 player or other audio-visual sources.
- Bass Boost and Bass Reflex System.
- Magnetically Shielded.

\$29

MOPH1000



A1.2 Fun Power Plus

- Active 10 watts from two 5 watt desktop speakers for connection to a stereo sound card, CD/cassette/MP3 player, etc.
- Bass boost and Bass Reflex System.
- Magnetically shielded.

\$49

MOPH1001



A2.3 Speaker System

- Active High Power 32 Watts RMS 3 piece speaker system (2 x 6W speakers and 1 x 20W subwoofer).
- High Quality sound, Compact Powerful Subwoofer, High Clarity Satellite speakers
- Remote Control, Bass Boost, Magnetically shielded

\$99

MOPH1002



Zip 250 USB

All the benefits of the Zip 250 plus all the advanced features of the USB technology. True hot plugging technology and super fast USB connection. The new drive is compatible with both Windows and Macintosh, it also features a compact ultra thin case.

**1.44Mb Floppy
Why Bother???**

250MB Zip + PCMCIA Bundle

\$449 BUIOM043



\$399
BUIOM040

Zip Drives

Increase your storage quickly, easily and economically - as you need it. With a 100MB Zip Drive you can take your data anywhere at anytime. Each disk stores 100MB of data and you can add them, as your needs grow. Available in Parallel, SCSI, Internal IDE and the new USB interface. You also get Zip tools on CD.



IDE ATAPI OEM
100MB EXT PARALLEL ZIP Drive
100MB USB ZIP Drive

\$135 BUIOM007
\$229 BUIOM000
\$195 BUIOM026

Zip 250

zip 250

SuperFloppy Preferred By Millions

The new drive comes in two flavors: parallel port (for PC's) and SCSI (for Mac's or PC's with a SCSI connection). Zip 250 SCSI drive users will benefit from a performance boost, up to 56 times faster than standard floppy drives and 1.4 times faster than external CD-ROM drives. Best of all, current Zip 100 drive users need not worry about their investment in 100MB Zip using 250MB media).

- Proven Reliability • Large 250Mb Capacity
- Compatible with 100Mb Zip Disk
- 50% faster than the original Zip 100 drive.

PARALLEL **\$355** BUIOM033
SCSI **\$325** BUIOM032
Internal IDE **\$329** BUIOM044
Internal IDE OEM **\$199** BUIOM046



ZipCD

The ZipCD 4x4x6 external USB drive will enable PC and Macintosh® computer users to record, archive, share, and distribute up to 650MB of data on a common CD format. The ZipCD USB drive is high-capacity, and ideal for saving and sharing. The USB interface allows quick and easy installation and "plug-and-play".

\$509
MMIOM001



Internal IDE 32/12/10
Internal IDE 32/8/4
Internal Predator 32/8/4

\$589 MMIOM003
\$249 MMIOM002 While Stocks Last
\$595 MMIOM004

PLEXTOR

PLEXWRITER

12/10/32A

- Achieved Ultra High Recording Quality with 12X Write Speed and 10X Rewrite Speed
- BURN-Proof (Buffer Under Run-Proof) Technology is Supported
- Wide CD-R and CD-RW Media Compatibility

\$715
MMPLE001



CD-R/RW

ORB

Storage

Look at the power ORB delivers!

- 3.5 hours of audio
- 2+ hours of video
- 2,000+ colour photographs
- 22 100MB floppy disks
- SCSI, EIDE or Parallel Port versions
- 1500+ 1.44MB floppy disks
- 3+ CD ROM games

ORB Internal IDE **\$319** BUORB000
ORB Internal IDE OEM **\$305** BUORB006
ORB Internal SCSI **\$339** BUORB002
ORB Internal SCSI OEM **\$325** BUORB007
ORB External SCSI **\$385** BUORB003
ORB External USB **\$429** BUORB004
ORB Disk **\$65** BUORB005



CASTLEWOOD

Sales Staff are Available (est)
9am-6pm Monday to Friday
10am-4pm Saturday

Technical Support
(5 Days a week 9am-5.30pm)
Phone (02) 8344 3160

Sales Hotline 02 8344 3190



Lacie DVD-RAM Drives

The LaCie DVD-RAM drive brings rewritable DVD technology to desktop computing. It offers up to 9.4GB of removable storage, combining CD, DVD and back-up capabilities in one drive, and is ideal for Windows and Macintosh users.



LaCie External 9.4GB FireWire DVD-Ram Drive **\$1585** MM-LAC008
LaCie External 9.4GB SCSI DVD-Ram Drive **\$1585** MM-LAC010

Lacie CD-RW Drives

LaCie external CD-RW drives offer the best in flexibility and performance with a range of connectivity. The USB, SCSI and Firewire drives include Easy CD Creator 4.0, Direct CD and Toast 4.1 for cross platform sharing.



Description	Price	Code
4x4x24x USB	\$559	MM-LAC000
8x4x32x Firewire	\$629	MM-LAC001
12x10x32x Firewire	\$825	MM-LAC011
16x10x40x Firewire	\$949	MM-LAC012
8x8x24x SCSI	\$669	MM-LAC013
12x10x32x SCSI	\$799	MM-LAC014
16x10x40x SCSI	\$949	MM-LAC01

Welcome to the LaCie connectivity revolution. Utilising either the FireWire or USB interface for MacOS, windows 98 and Windows 2000, Lacie External hard disk drives offer the ultimate portable storage solution. With a simple cable and hot-plug capability, the LaCie range of external hard disk drives are ideal for portable mass storage. The FireWire and Pocket Hard Drives go even further, offering RAID 0 as a standard feature.

Lacie FireWire External Hard Drives

LaCie External FireWire Hard Drives offer up to 14Mb/s sustained transfer rate, making them ideal for multimedia or large files.



20GB **\$559** HDLAC000
40GB **\$729** HDLAC008
60GB **\$885** HDLAC009
75GB **\$1465** HDLAC010

Lacie USB/FireWire Pocket Hard Drives

Offering both USB and FireWire connectivity, LaCie Pocket Hard Drives offer the widest range of connectivity to today's portable computers.



10GB **\$975** HDLAC004
20GB **\$1329** HDLAC005
30GB **\$1685** HDLAC007

Lacie External USB Hard Drives

Increase the storage space on your portable computer, or transfer data quickly and easily between your desktop and notebook with the LaCie external USB drive.



20GB **\$485** HDLAC006

Argosy USB/PC-Card Hard Drive Case

Available in either USB or Type II PC-Card, and supporting 2.5" Hard Drives up to 20GB, Argosys Hard Drive cases are the perfect solution for upgrading your notebook storage needs.

USB Interface **\$129** CAARG000
PCMCIA Type II Interface **\$129** CAARG001



Argosy CD-RW

Record CD's Quickly and easily with the Argosys RW860 External CD-RW Drive.

PCMCIA 24x4x4x CD-RW Drive **\$515** MMARG000
USB 24x4x4x CD-RW Drive **\$515** MMARG001

Also Available

PCMCIA 24x CD-Rom **\$289** MMARG002
USB 24x CD-Rom **\$309** MMARG003
PCMCIA DVD-Rom **\$565** MMARG004



Internet Keyboard

Includes 10 hot keys on a comfortable design that also features a detachable palm rest for added comfort. Hot Keys allow instant access to email and internet functions.



\$45 IOMST015

Natural Keyboard Pro

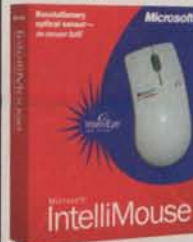
The new ergonomic Microsoft® Natural® Keyboard Pro features 19 "Hot Keys," which link directly to applications on your PC and the web. Plug in up to 2 USB devices directly into your keyboard.



\$79 IOMST014

IntelliMouse IntelliEye

The IntelliMouse with IntelliEye gives you superior precision with its revolutionary optical sensor that scans your desktop 1,500 times a second. It also features an ergonomic design and a wheel for efficient zooming and scrolling.



\$55
IOMST013

IntelliMouse Explorer

Point and click with pinpoint accuracy-literally! The new IntelliMouse Explorer from Microsoft is so advanced, it doesn't need a mechanical ball as its been replaced with the new IntelliEye optical sensor, which provides consistent accuracy and control on virtually any surface.



\$85
IOMST012

Cordless Wheel Mouse

Fast scrolling with cordless freedom. A comfortable, rounded shape provides easy control for right and left hands. Logitech's innovative wheel design provides both a true scroll wheel and the extra convenience of a third mouse button.



\$79 IOLOG026

Cordless MouseMan Wheel

The Cordless MouseMan® Wheel combines cordless freedom of movement with a sleek, comfortable shape that offers unique soft-touch sides. Logitech's advanced digital radio technology eliminates the struggle with cords.



\$95 IOLOG028

Cordless Freedom Navigator

With convenient Internet and multimedia control, access the Internet; visit Web pages; open e-mail; search; play CD/DVD's and Windows™ media files, adjust volume, and more with one touch of a key.



\$195 IOLOG033

Cordless Desktop Pro

Comfortable rounded mouse provides precise control for left and right hands. With convenient iTouch™ Internet and multimedia control. Includes the batteries that power the keyboard and mouse for up to a year.



\$225 IOLOG029

Logitech® QUICKCAM™ VC PC Video Camera

- Works with Windows 95 and Window 98 videoconferencing solution that brings the excitement, and expressiveness of video communications to your desktop.
- Capture still images and video clips in colour

USB
\$169
IOLOG014



Logitech® QUICKCAM™ Express USB

Easy to install - Plugs in and installs in minutes
Capture stills and video with the touch of a button
E-mail photos quickly and easily - no camera required at the other end. For USB-enabled PCs. Comes with Microsoft NetMeeting, Audio Wizard for microphone installation (microphone not included), Microsoft Internet Explorer



OEM **\$95** IOLOG023

Logitech® QUICKCAM™ PRO PC Video Camera

- Larger, more vibrant pictures
- Videoconferencing, video e-mail
- The Logitech QuickCam Pro captures image at a true 640 x 480 resolution. That's 3 times the resolution of standard 352x288 size cameras.



USB **\$219** IOLOG017
PARALLEL **\$219** IOLOG016

THRUSTMASTER

Gaming

Ferrari 360 Modena

The officially Ferrari® licensed 360 Modena® replica racing wheel is equipped with comfortable rubber textured handgrips and authentic F1 gearshift levers as well as dual acceleration and braking systems with either progressive wheel mounted levers or stable foot pedals. An easy to clamp central fixation system provides gamers with maximum stability for hours of virtual race track fun and excitement.



\$85 IOGUI004
Ferrari Force Feedback Racing Wheel
\$205 IOGUI007

Top Gun Fox 2

The Top Gun™ Fox™ 2 Joystick is both ergonomic and highly realistic. This innovative, high-quality stick includes a sliding thumb throttle, realistic masked Fox 2 button, 2 quick-action buttons and rubber-textured grip.



\$39
IOGUI005



Top Gun Afterburner Force Feedback

The Top Gun™ AfterBurner™ Force Feedback Joystick brings full-flight excitement to your gaming. Features a full-sized detachable throttle, 2 powerful motors and up to 60 programmable functions. For use with PC and iMac™

Also available
Top Gun Afterburner
\$95 IOGUI008



\$145
IOGUI006

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10am-4pm Saturday

Technical Support
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Sales Hotline 02 8344 3190



Procurve Switches

10/100/Gigabit modular switch providing the easiest way to build a high-availability backbone for maximum uptime.

HP ProCurve Switch 8000M
\$2,495 NWHPD015

10/100/Gigabit desktop switch ideal for scalable, expandable, low-cost migration to 10/100/Gigabit switching to the desktop.

HP ProCurve Switch 4000M
\$4,315 NWHPD017

A low cost, managed 24-port, expandable 10/100 Ethernet desktop switch ideal for low-cost migration to 10/100 switching.

HP ProCurve Switch 2424M
\$2,529 NWHPD012

An affordable high-speed switch that offers fast, reliable, manageable connectivity and is ideal for easy migration to fast performance and for server farm connectivity.

HP ProCurve Switch 1600M
\$1,995 NWHPD016

Low-cost desktop switch ideal for delivering performance to workgroups with a mix of 10Mbps and 100Mbps devices and for migrating from 10Base-T to 100Base-TX.

HP ProCurve Switch 2224
\$1,089 NWHPD013

Compact switch ideal for building small networks or connecting peripherals with any combination of 10Mbps and 100Mbps devices.

HP ProCurve Switch 408
\$309 NWHPD014

Desktop switches that provide low-cost, dedicated 10Mbps Ethernet switching performance to the desktop with high-speed 100Mbps connections to a server or network data center.

HP ProCurve Switch 224M
\$1,249 NWHPD006
HP ProCurve Switch 212M
\$875 NWHPD005

Procurve Hubs

Low cost 10/100 hubs ideal for connecting workgroups with a mix of 10Mbps and 100Mbps devices as well as for any workgroup that is migrating from 10Base-T to 100Base-TX.

HP ProCurve 10/100 Hub 24M
\$1,999 NWHPD002

HP ProCurve 10/100 Hub 12M
\$1,159 NWHPD001

HP ProCurve 10/100 Hub 24
\$1,079 NWHPD004

HP ProCurve 10/100 Hub 12
\$829 NWHPD003

Cost-effective 24- and 12-port 10Base-T hubs ideal for building a new network or expand an existing one.

HP ProCurve 10Base-T Hub 12
\$249 NWHPD007

HP ProCurve 10Base-T Hub 12M
\$499 NWHPD008

HP ProCurve 10Base-T Hub 24
\$415 NWHPD009

HP ProCurve 10Base-T Hub 24M
\$665 NWHPD010

Simple, low-cost hubs to create a new 10Base-T network or to expand an existing one. Ideal for business, home and residential use.

HP ProCurve 10Base-T Hub 8
\$135 NWHPD011



Modems



Swann Smart II 56K



Simplicity and stability are what made this modem win a 'best buy' award against 17 leading-brand modems tested. The Swann Smart II 56K External Modem's clever upright design, not only takes up less desk space, but defies heat, the enemy of all modems. Perfect for the family and new computer user and those new to the internet.

Internal
\$55
FMSWAD01

External
\$175
FMSWAD00



Dynalink 56k External Modem

- V.90 / K56flex dual-mode for high Internet compatibility
- Plug 'n play, plus friendly QuickGuide for easy installation.
- Send and Receive faxes with high speed and clarity from your PC.
- FaxStream DUET, Caller ID, Voice Mail, Handsfree Speakerphone Mode.
- Free-call Tech Support

VoiceDesk56 Pro External
\$129 FMDYN001

VoiceDesk56 ISA Internal
\$119 FMDYN000

XIRCOM

RealPort2 Integrated PC Cards

Xircom's RealPort Integrated PC Cards connectors are built right in. don't have to worry about lost cables. Choose from two Integrated PC Card solutions. RealPort2 Integrated PC Cards offer mix and match flexibility with the benefits of robust built-in connectors.



CardBus Ethernet 10/100
\$299 NWXR010

GlobalACCESS Modem
\$379 NWXR011

RealPort Ethernet 10/100+Modem 56

The RealPort Ethernet 10/100+Modem 56 combines 10/100Mbps Ethernet, 56K modem, GSM, AMPS cellular and ISDN connectivity, in a single cable-free Integrated PC Card solution. GlobalACCESS™ features make it easy to connect anywhere in the world.

\$739 NWXR008

ROADSTER

II ULTRA 56K

Great for gamers as well as the business user, this modem features V90 as well as K56 flex protocols. Comes in either the new advanced USB interface or the traditional serial interface.



USB
\$225
FMNET015

Serial
\$199
FMNET012

BANKSIA EasiHub56 USB
Modem + Hub

The EasiHub USB allows you to add an additional three ports to your single host port and simultaneously surf the net via its built-in 56k modem.

- V.90 & K56Flex Supported
- Connect an additional 3 USB devices
- Power Pack included for optimal performance
- Power and port activity LEDs



\$199 FMBAN007

BANKSIA

Wave II SP

The Wave SP 56 supports both V.90 and K56flex standards to ensure you can connect to the widest range of Internet Service Providers. With Simultaneous Voice & Data with speakerphone, digital line protection, fax capabilities, smart & answerphone with multiple password protected mailboxes, the Banksia Wave II SP covers all of your telecommunication needs.



\$205 FMBAN003

D-Link DES-1016R

16 Port Switch for Workgroups

Built with advanced functions, these switches are designed for the workgroups with advanced requirements. Powerful yet easy to use, they allow users to simply plug any prot to either a 10Mbps or 100Mbps node to multiply bandwidth, boost reponse time and satisfy heavy load demand. Rack mountable



\$899 NWDL032

D-Link DES-1008D

8 Port Fast Ethernet Switch

The D-Link DES -1008D is a powerful desktop Dual Speed 8-port 10/100Mb Ethernet/Fast Ethernet NWay auto-negotiating Switch.



\$325 NWDL055

D-Link DU-C300

USB Digital Video Camera

Leading edge CMOS sensor technology and video compression engine, USB interface web camera. Performance: 30fps @ CIF (352x288), 30fps @ QCIF (176x144), 18fps @ VGA (640x480); Focal length: 5 mm - Infinity



NEW
\$125 NWDL000

D-Link DWL-650

D-Link Air Wireless PCMCIA Network Card.

11 Megabit Performance. IEEE 802.11b. Make any notebook truly portable within your office enviroment.

NEW

NEW TECHNOLOGY



\$359 NWDL062

DWL-120 D-Link Wireless usb **\$399** NWDL063

DWL-500 D-Link Air Wireless PCI **\$539** NWDL060

DWL-1000AP D-Link Air Access Point **\$1089** NWDL059

D-Link DI-701

Cable ADSL Gateway

The D-Link DI-701 Residential Gateway protects your computers from hackers or unwanted users. It is the easiest and safest way to share your high-speed internet connection with a DSL Modem or Cable Modem.



NEW
\$425 NWDL056

D-Link DU-560M

External 56K V.90 & K56 Flex USB Voice/Fax/Modem

Based on the ITU's fastest modem provides up to 56Kbps transmisson over the phone line. Small enough to fit in a pocket, this modem is the perfect solution for desktop and notebook computers. As a USB device, it is also the eaieist modem to install.



\$109 FMDL004

Model	Price	Code
DP-303 10/100 3 Port Print Server (1x Ser, 3x Par)	\$349	NWDL061
DFM-560E External 56K, V.90 Modem	\$125	FMDL000
DFM-560I Internal PCI V.90 56k Voice/Fax/Data Modem	\$79	FMDL001
DU-H4 4 Port USB Hub	\$75	NWDL037
DFE-908DX 8 Port 10/100Mbps Dual Speed Hub	\$325	NWDL012

Model	Price	Code
DFE-916DX 16 Port 10/100Mbps Dual Speed Hub	\$599	NWDL014
DFE-650TXD 10/100M No Dongle PC Card	\$149	NWDL054
DP-602 2 Port Internet Ready Server	\$435	NWDL024
DFE-530TX PCIBus 10/100 Base TX Fast Ethernet Adaptor	\$45	NWDL002
DE-809TC 8Port 10M Hub, 1 BNC	\$109	NWDL004

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Sales Hotline 02 8344 3190



BJC-1000SP

- Everything you need. Vivid colours, even on plain paper, plus optional high speed black & white.

The PhotoRealism to provide the gold standard in photographic reproduction

- 4ppm Black / 0.5ppm Colour
- 720 x 360 DPI



\$109

PRCAN039

BJC-2100SP

- The BJC-2100 Series Colour Bubble Jet Printer is the perfect choice for printing letters, full-colour Web pages, beautiful photos or personalized birthday greetings. It handles everything with ease and offers superb 720 x 360 dpi quality at a truly great value.
- Parallel & USB connectivity
- 720 x 360 DPI Resolution
- 5 ppm black / 2 ppm colour



\$149

PRCAN040

BJC-3000

- Want photoquality colour and laser quality text, this versatile printer is breaking price barriers. Capable of 1440 dpi, it features separate ink tanks and easy to use USB connection as well as parallel.
- 9ppm Black / 4ppm Colour
- 1440 x 720 DPI



\$255

PRCAN034

BJC-6200

- Cost-effective, fast and immensely functional. The Canon BJC-6200 is the powerful print performer for busy offices. Boasting Canon's unique separate ink tank system to minimise waste and costs, and rapid print speeds of up to , this efficient Colour Bubble Jet printer makes high-volume printing truly swift and smooth, economical and efficient.
- Parallel & USB connectivity
- 0ppm Black / 7ppm Colour
- 1440 dpi



\$375

PRCAN041

BJC-6500

- Faster printing for business applications/ superior quality for design applications. The BJC-6500 sets a new value standard in A3 printers. Independent ink tank technology, optional A3 scanning and 6 colour photo printing all at an amazing price.
- 9ppm Black/6 ppm Colour
- 1440 x 720 DPI



\$649

PRCAN035

BJC-8200

- Turning out the most amazing image quality, the new flagship of the Canon Bubble Jet range is a showcase of new technologies. Using 6 Colour printing, the BJC 8200 is capable of up to 33 levels of graduation.
- 3ppm Black/3ppm Colour
- 1200 x 1200 DPI



\$645

PRCAN036

LBP-1000

- The perfect workhorse for departments and businesses demanding maximum quality in minimum time. Designed for easy installation, upgrade and connection to a wide range of Local Area Networks with optional ethernet adaptor.
- Maintenance free 'all-in-one' toner and drum cartridge.
- PCL6 Print Language emulation.
- 10ppm
- 1200 DPI



\$1,195

PRCAN039

LBP-800

- Compact desktop 8ppm laser printer with face up or down paper delivery, 125 page Multipurpose Tray and single sheet Manual Feed Slot. Comprehensive job control via Canon Advanced Printing Technology driver software including Match Paper Size, Multipage per Sheet, collate, Form Overlay, Customer Paper Size, Toner Saver and Automatic Image Refinement modes.
- 8ppm
- 600 x 600 DPI



\$539

PRCAN030

BJC-85

- The award-winning, portable BJC-85 Colour Bubble Jet Printer gives you the power to print wherever you go. It features a built-in USB and parallel port for connection to any compatible Mac® or PC; fast IrDA for wireless printing; dual voltage AC adaptor for hassle free world wide printing ;and the ability to become a colour scanner with the optional IS-12 Scanner Cartridge.
- 720x360 dpi in black and colour.
- Built-in USB and Parallel Port
- 5 ppm black / 2 ppm colour



\$369

PRCAN038

Outstanding value for home colour printing

Epson Stylus Colour 580

The EPSON STYLUS COLOR 580 is ideal for home, school and home office use. It provides easy, plug-and-play support for Windows 98/2000 and USB equipped Macintosh systems, and comes with everything you need to print beautiful colour images from the moment you set it up.

- Up to 1440 dpi Photo quality printing resolution
- Up to 6.0ppm black text printing
- Windows and Mac compatible



\$185

PREPS038

State of the Art Inkjet Printer - for Advanced Home and SOHO Users

Epson Stylus Colour 680

Industry leading 2880 dpi print resolution and super fine 4pl Micro Droplets are just a couple of features delivered thanks to EPSON's state of the art EPSON Micro Piezo printing technology. Not only are images produced from this printer indistinguishable from photographs, Micro Piezo technology also ensures high-speed throughput with crisp, sharp text.

- Up to 2880 dpi Photo quality printing resolution
- Up to 8.0ppm black text printing*1
- Windows and Mac compatible



\$319

PREPS039

6-colour, Photo Reproduction Quality printer for the home and office

Epson Stylus Photo 720

The EPSON STYLUS PHOTO 720's high-quality, 6-colour printing ensures superior results on everything from documents to greeting cards, photo stickers and t-shirt transfers. Combining the superior performance of EPSON's PPIS and 1440 dpi resolution, this new printer offers high image quality for the home and small business user. It also features 7 picolitre Ultra Micro Dots to deliver dazzling details superb image quality.

- Up to 4.3 ppm black text printing speed



\$425

PREPS037

State of the Art Inkjet Printer - for Advanced Home and SOHO Users

Epson Stylus Colour 760

Delivers a precisely controlled ink droplets - the result is greater detail and smoother halftones. It's PC and Mac compatible and offers USB connectivity.

- 7ppm Black/6.8ppm Colour
- 1440 X 720 DPI



\$355

PREPS030

The fastest inkjet printer in its class

Epson Stylus Colour 900

Introducing the EPSON STYLUS COLOR 900 inkjet printer, the fastest colour inkjet in its class. The STYLUS COLOR 900 prints at 12ppm - an amazing one page every five seconds. The STYLUS COLOR 900 is ideal for the business environment, catering for different business needs such as black text, colour presentations and graphs. It also offers flexible connectivity solutions, including Universal Serial Bus (USB) for Windows 98 and iMac's, and Mac G3.

- Resolution Maximum 1440 x 720 dpi
- Up to 12 ppm black text printing speed



\$655

PREPS024

A3+ Photo Quality inkjet for business and professional graphics users

Epson Stylus Colour 1160

The new EPSON STYLUS COLOR 1160 is a revolutionary printer targeted at business and professional graphics users wanting maximum colour output combined with speed, affordability and the versatility of printing larger than A3. It's industry-leading print resolution of up to 1440 dpi and high-speed printing capability makes the EPSON STYLUS COLOR 1160 the ideal printer for busy professionals. 1440 x 720 dpi printouts on plain paper.

- Resolution 1440 x 720 dpi
- Up to 9.5ppm black text printing speed



\$789

PREPS032

Canon

Scanners

N-640P

- Parallel
- A4 36-bit Scanner
- 600 x 1200 DPI Optical Resolution
- Includes Canon Software Bundle

\$155

IOCAN016

Parallel Interface

N-660U

- USB
- A4 36-bit Colour Scanner
- 600 x 1200 DPI Optical Resolution
- Includes Canon Software Bundle

\$285

IOCAN017

600 x 1200 DPI

N-650U

- USB A4 36-bit Colour Scanner
- 600 x 1200 DPI Optical Resolution
- Windows 98, iMac & Mac G3 Compatible
- Includes Canon Software Bundle & Canon Mac Plug-in (Canon Scan Toolbox in Place of Scan gear Mac Adobe Photo Deluxe 20.)

\$175

IOCAN014



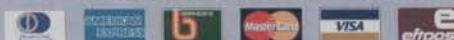
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Sales Hotline 02 8344 3190



Deskjet 640

- Produce projects with photo-quality images and crisp black text for school and home easily, quickly and creatively with the new HP Deskjet 840C printer.
- 6.5ppm Black / 4.5ppm Colour
- 600 x 600 DPI Photo REt II

\$175

PRHPD079



DeskJet 840

- Inexpensive and easy to use, the HP DeskJet 640C printer produces affordable, high-quality colour and black printing for all your home and school needs.
- 5ppm Black / 2.5ppm Colour
- 600 x 600 DPI
- Optional Photo printing.

\$265

PRHPD080



DeskJet 930C

- This is the printer to get if you need top notch performance but don't have the space for it. With innovative features like print cancel button, this printer is both easy to use and setup. Utilising parallel and USB interfaces, this printer is compatible with PC and Mac.
- 9ppm Black / 7.5ppm Colour
- 2400 x 1200 DPI
- Photo REt 3

\$309

PRHPD071



Deskjet 970Cxi

- The premier photo-quality printer for busy professionals who take their image very seriously. Featuring stunning photo-quality with PhotoREt 3, and laser like text at up to 12ppm. Innovations like automatic two sided printing, USB connection and extra large 150 sheet paper tray are exclusive to the 970Cxi.
- 12ppm Black / 10ppm Colour
- 2400 x 1200 DPI
- PhotoREt 3

\$689

PRHPD063



LaserJet 1100

- You need the convenience and privacy of a personal printer. With the HP LaserJet 1100 printer, you can put fast, personal laser printing for business right on your desk.
- 8ppm Black Laser
- 600 x 600 DPI
- 120 sheet paper tray
- Optional Scanner attachment

\$729

PRHPD041



LaserJet 3150

- The HP LaserJet 3150 is a versatile business tool that delivers convenient printing, faxing, copying and scanning capabilities in a single laser device, and enables you to communicate more effectively with customers and clients.
- 6ppm Black Laser
- 600 x 600 DPI
- 100 sheet paper tray

\$1219

PRHPD034



OfficeJet 725

- The HP OfficeJet Series 725 prints, faxes, scans and copies all in colour. That's right-it even sends and receives colour faxes with other colour fax machines. You can even scan and send colour documents to anyone with an email address.
- 5ppm Black/ 2ppm Colour
- 600 x 600 DPI Photo REt
- 150 sheet paper tray

\$529

PRHPD055



HP Office R65

- The reliable HP OfficeJet R65 Series gives you high quality performance and versatility for professional results. The razor-sharp text and fast, photo-quality colour printing makes documents stand out, whether they're financial spread sheets or colour brochures.
- 11ppm Black/ 8.5ppm Colour
- 600 x 600 DPI Printing
- 600 x 2400 DPI 30 bit Flatbed Scanning
- 100 sheet paper tray
- 30 page automatic document feeder

\$879

PRHPD059



OfficeJet G85

- The HP LaserJet G85 is HP's premium performance colour flatbed all-in-one with automatic document feeder for your office.
- 12ppm Black / 10ppm Colour
- 2400 x 1200 DPI colour
- Photo REt 3

\$1345

PRHPD075



Scanners

ScanJet 3300C

For easy scanning and copying, try the HP ScanJet 3300C. Setup is a breeze with the USB interface and Windows 98. Just plug it in. You can scan or copy at the touch of a button.

- 36bit internal
- 600 x 1200 DPI
- 9600 DPI enhanced
- Windows 98 USB
- HP PrecisionScan LT with automated OCR
- Push button Scan and Copy

\$179

IOHPD027



ScanJet 5300C

The HP ScanJet 5300C colour scanner delivers quality results up to three times faster than other scanners. One button starts any project! The HP ScanJet 5300C offers hassle-free connectivity through the parallel port, or Universal Serial Bus (USB).

- 36bit internal
- 600 x 1200 DPI
- 9600 DPI enhanced
- USB and Parallel port connection
- HP PrecisionScan 2.0 with automated OCR

\$445

IOHPD029



ScanJet 6300C

Uncompromised speed and quality, the 6300C is HP's professional series scanner. Using Intelligent Scanning technology, the 6300C can eliminate all the steps that slow you down while delivering first class results.

- 36bit internal
- 1200 x 2400 DPI
- unlimited DPI enhanced resolution
- USB and SCSI
- HP PrecisionScan Pro with automated OCR

- Push button Scan, Copy, Email, Fax and File

\$725

IOHPD026



Microsoft Office 2000 Value Pack

The world's most popular Office suite now comes packed with value! The Office 2000 Value Pack combines the software and accessories ideal for home and business.

Inside this Value Pack you'll find everything you need to:

- Create professional documents and presentations.
- Manage your calendar and email.
- Attract new customers and better manage your existing ones.
- Scan your system and incoming emails for viruses.
- Send pictures to family and friends.

Over \$1700 RRP
worth of software
& accessories

NEW

Package Includes:

- Microsoft Office 2000 Standard Upgrade
- Microsoft Publisher 2000
- Microsoft Encarta® 2000 Standard
- Microsoft Age of Empires™ I
- Microsoft IntelliMouse® Explorer
- Symantec Norton AntiVirus™ 2001
- FrontRange Solutions GoldMine® 5.0
- Intel® Easy PC Web Camera
- Communicate Magazine - 6 month subscription

\$599 SWMST111



Windows 2000 Professional	\$555 SWMST088	Microsoft Office 2000 STD	\$945 SWMST076
Windows 2000 Professional Prior (for win98 users) Upgrade	\$429 SWMST089	Microsoft Office 2000 STD UPG	\$485 SWMST077
Windows 2000 Professional (for NT users) Upgrade	\$289 SWMST090	Microsoft Office 2000 PRO	\$1135 SWMST078
Windows 2000 Professional Server 5 Client	\$1515 SWMST091	Microsoft Office 2000 PRO UPG	\$629 SWMST079
Windows 2000 Professional Server 5 Client Upgrade	\$939 SWMST092	Microsoft Office 2000 SBE	\$945 SWMST080
Windows ME	\$339 SWMST109	Microsoft Office 2000 Premium	\$1509 SWMST081
Windows ME UG/95	\$179 SWMST105	Microsoft Office 2000 Premium UPG	\$775 SWMST082
Windows ME UG/98	\$95 SWMST110		

If you have any questions, simply call our friendly sales team on 02 8344 3190.

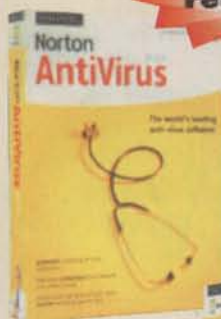
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**Windows
ME
ready!**

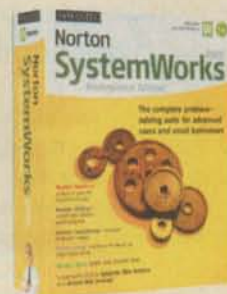


- Norton Antivirus 2001
Compatible with 95, 98, ME, NT & 2000

\$85 SWSYM025

- Norton SystemWorks 2001 Professional Edition
Includes: Antivirus 2001
Utilities 2001
CleanSweep 2001
Web Services 2001
Ghost 2001
WinFax 10.0 Basic Edition
Compatible with 95, 98, ME, NT & 2000

\$179 SWSYM027



- Norton SystemWorks 2001
Compatible with 95, 98, ME, NT & 2000

\$135 SWSYM026

- Norton Utilities 2001

\$85 SWSYM028

- Norton Clean Sweep 2001

\$59 SWSYM029

- Norton Ghost 2001

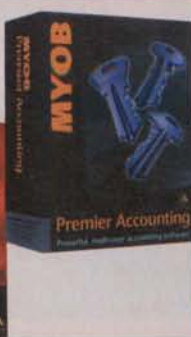
\$125 SWSYM030

- Norton Internet Security 2001

\$45 SWSYM031

Software

MYOB



MYOB First Accounts

\$195 SWSYM000

MYOB Accounting

\$389 SWSYM001

MYOB Accounting Plus with Payroll

\$569 SWSYM002

MYOB Premier Accounting 3 Users

\$1075 SWSYM003

MYOB Accounting V.10 Upgrade

\$185 SWSYM007

MYOB Accounting Plus V.10 Upgrade

\$269 SWSYM008

Software

Quicken

QuickBooks V7

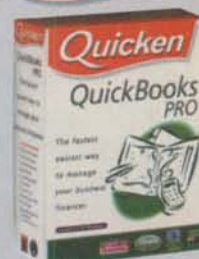
\$219 SWSYM014

QuickBooks Pro V7

\$379 SWSYM001

QuickPOS V2 with QuickBooks Pro

\$1059 SWSYM012



* Quicken's GST free upgrade Guarantee makes the GST transition as quick and easy as possible.

EXTERNAL IDE CD-ROM CASE



It has never been easier to add a CD-ROM to your PC. With the Portable CD-ROM, you are only one cable away from numerous CD titles and flexibility. Connects to your Windows or DOS PC via the parallel port (LPT). A printer passthrough interface is also included so that your printer can work simultaneously with your CD-ROM.

\$130 CAADE008

EXTERNAL SCSI CD-ROM CASE

Use your Internal SCSI CD-ROM or drives as a portable & removable device with the External SCSI CD-ROM Case. For both MACs & PCs the External SCSI Case comes with a SCSI ID selector so that changing SCSI IDs is as easy as clicking a switch.



CAADE007 SCSI I Centronics Case **\$135**
CAADE015 SCSI II DB50 Case **\$150**
CAADE016 SCSI III DB68 Case **\$185**

USB Link

Win 95B, 98 Peer to peer network cable for USB capable desktop or laptop computers. Supported under Windows 95 rev. B and Windows 98, this cable enables files to be transferred between machines.



\$59

NWKOU000

USB to 10Base Ethernet Adaptor

Win 95, 98 Join your USB enabled PC to an Ethernet network. Simply connect this adaptor between your PC and the network connection, setup the Windows networking software. Supports 10Mbit/sec transfer rate via an RJ-45 link.



\$95

NWKOU001

USB to Printer Cable

Win 95B, 98 Add parallel port devices to your USB capable PC. Run standard printers using a fast and simple connection system. Supports standard, ECP and EPP parallel port modes.



\$50

CBKOU000

Ethernet Transceiver

Connects sAUI-IS to Ethernet 10 Base 5, 10 Base T. (RJ45)



\$55

NWGEN011

SPECIAL

CS-102 AT Switch
Connect 2 Computers

to 1 Monitor

\$195

DSADE030

CPU Switch Cable Set

Each cable set connects to one computer.

Model	Price	Model	Price	Model	Price
3M AT Cable Set CS/122/114	\$29 CBGEN098	1.8M PS/2 Cable Set CS122/114/138	\$25 CBGEN164	3M AT Cable Set CS1008/1016 Audio	\$29 CBGEN169
3M PS/2 Cable Set CS/122/114/138	\$29 CBGEN099	10M PS/2 Console Extension M/F	\$55 CBGEN166	5M PS/2 Cable Set CS1008/1016 Audio	\$45 CBGEN170
3M AT Cable Set CS128	\$35 CBGEN127	3M PS/2 Cable Set CS 1008/1016 Audio	\$35 CBGEN168	5M AT Cable Set CS1008/1016 Audio	\$45 CBGEN171
3M PS/2 Cable Set CS128	\$35 CBGEN128				

CPU Switches

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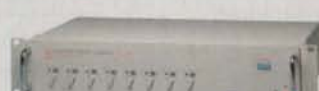
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More monkey business

Escape from Monkey Island

The Monkey Island series is legendary in PC gaming circles for its cuttily sharp humour, eccentric array of lovable characters and intricate puzzles. *Escape from Monkey Island* is LucasArt's fourth and latest addition to the series. Once again, you assume the role of Guybrush Threepwood, the pirate wannabe, and embark on yet another round of Caribbean island-hopping antics.

Previous Monkey Island adventures have followed a fairly similar format:

Guybrush pits his wits against a range of challenging puzzles and dastardly enemies, and the climax is a final confrontation with his nemesis, the demon/zombie/ghost pirate LeChuck. *Escape from Monkey Island* also follows this pattern, but it possesses enough originality to make it a great game in its own right. As usual, there are some distinctive enemies, the most notable of which is Ozzie Mandrill. Ozzie is an evil, pirate-hating, Australian entrepreneur bent on forcing your buccaneer brethren out of the Caribbean through a variety of villainous schemes.

Since American treatments of Australian characters are usually very stereotyped (not to mention getting our accents and mannerisms completely wrong), we approached this character with a certain amount of wariness and skepticism. However, the folks over at LucasArts seem to have done a reasonably good job on Ozzie (the actor that plays him is an Australian expat), and although his accent is a bit rich at times, it isn't bad enough to be grating. Ozzie uses some great Australian colloquialisms in his insult-sword-fighting (another element from previous games). These are meant to be completely incomprehensible, but are easily understood by anyone who has grown up in Australia.

Escape from Monkey Island's most obvious improvement on its predecessors is its move to 3D graphics (the game now requires a 3D accelerator). It now looks very similar to *Grim Fandango*, another great LucasArts adventure title. The game plays like a cross between traditional point 'n' click adventures and *Resident Evil* without weapons. Guybrush and his fellow islanders are nicely rendered in

Fight dastardly enemies and solve intricate puzzles.

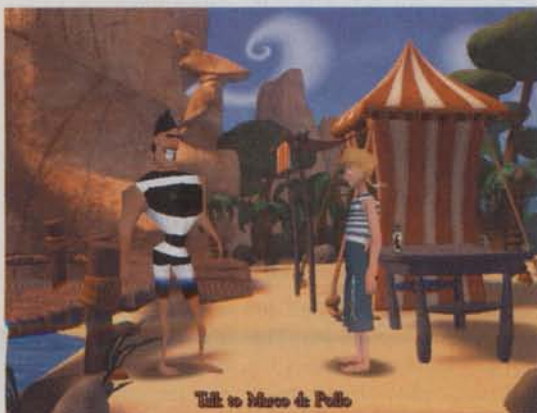
3D, and extravagantly painted 2D backdrops serve as environments. The characters are all closely modelled on their cartoon-based incarnations in *The Curse of Monkey Island*.

When it was released, *Curse's* 2D graphics were impressive for a number of reasons: they are smooth and well finished, they do their job with flair, and they don't detract from the gameplay. In

a 2D adventure game, you use the mouse to explore your surroundings and click when you want to move, pick up items or interact with objects or people. However, in a 3D title the play style is rather different. The game isn't mouse-controlled, it's keyboard/gamepad-driven. While in a 2D game you were able to examine your surroundings quite rapidly with the cursor, in a 3D title you run around large environs and have to look at every thing individually. This style of play works well in pseudo-adventure games like *Alone in the Dark* or *Resident Evil*, because there are enemies to blast as well as puzzles to be solved. However, in true adventure titles this is annoying at times, as it places more emphasis on exploration at the expense of character interaction and problem solving.

These small issues aside, *Escape from Monkey Island* is a fine addition to its lineage, smoothly weaving together all the old elements which made the first three so successful. It delivers all the monkey-centric enjoyment fans of the series have been slathering for, and it manages to remain fresh and exciting while doing so.

Daniel Gardiner



Contact Electronic Arts

Phone (02) 9955 7744

Online www.lucasarts.com/products/monkey4

Price \$89.95

Requires Pentium 200, Windows 95, 32M RAM

Classification G

Rating ■■■■■■■■

Starship Troopers

Starship Troopers is a mediocre real time strategy game, with some quite good graphics, a reasonable theme and middle of the road sound. This might make it sound bad, but it's not — it's just that it doesn't excel in any one respect. Everything it does has been seen a hundred times before in RTS games. The graphical look is straight out of the film, but it does



borrow some details from Heinlein's novel, especially when you gain access to power suits, which were omitted from the film.

Starship Troopers is very like the aging Amiga classic Cannon Fodder. Its action is squad-based, and there is an emphasis on treading carefully and annihilating the bug enemy by sheer force of numbers. It's all presented in 3D, and its camera control succeeds where other 3D RTS games (for example, the deeply flawed Force Commander) fail. The camera tracks independently, but can be refocused with the space bar. This takes some getting used to, but works as long as you don't have too many actions going on at once. The individual soldiers look a bit blocky, but the designers have got

the look of the bugs (from little ground crawlers to the massive plasma bugs) spot on. It's possible to sneak an entire platoon under the belly of one of these monsters — a terrifying experience.

Starship Troopers isn't very long — 20 missions are all you get — and there's no multiplayer option, so once you've finished it, there's not a whole lot to go back to. It's interesting enough to keep you playing to the end, but saving is only possible after you've completed an entire mission, so some players may not have the patience to get through the longer missions.

Starship Troopers is OK. That's all.

Alex Kidman

Contact Hasbro Interactive

Phone (02) 9953 8788

Online www.microprose.com

Price \$89.95

Requires Pentium 233, Windows 95, 64M RAM

Classification MA(15+)

Rating ■■■■■■■■

Motocross Madness 2

The latest addition to Microsoft's 'Madness' franchise, Motocross Madness 2 reproduces the addictive formula of its predecessor. In the original Motocross Madness, the addictive gameplay, simple controls and realistic modelling, combined with races and stunts, proved to be a great combination. The sequel has been tweaked, and there are heaps of tracks, a more varied racing environment, licensed gear and better crash animations.



The team at Rainbow Studios has gone to great lengths to create an authentic feel for this title. Bike manufacturers were involved in the game's production, so the modelling of the bikes is extremely realistic, and there are many customisation options, including engine size, features and colours. Clothes for your rider can also be changed.

Tearing around on a motorbike has never been so much fun. In addition to the races featured in the first Motocross game, there is a new one called Enduro. The area along this course is heavily populated, and if you're not careful, some fairly freaky accidents can occur with wayward spectators. Unexpected ground foliage may also present some hazards, although this feature can be turned off.

The Nationals and Supercross races use pre-determined courses, which don't

provide a lot of room for tricks and stunts, and tread the fine line between being challenging and frustrating. The Stunt Arena is back, giving you wacky stunts and crashes in more environments than you can poke a stick at. The cannon-shot feature is a classic: watching your rider and machine fly through the air at a ridiculous speed after riding out of the race area had APC staffers in fits of laughter.

Microsoft has included three multiplayer modes: league, team and ladder competitions. This should get you racing your buddies online in no time. This game is an enormous improvement on the original; the detailed landscapes and additional features make it a very creditable successor.

Ryan Shaw

Contact Microsoft

Phone 13 20 58

Online www.microsoft.com/games/motocross2

Price \$79

Requires Pentium 233, Windows 95, 64M RAM

Classification G

Rating ■■■■■■■■

Wizards & Warriors

It's been a long time since the last 3D first-person fantasy RPG was released, and if you're a fan of the genre you'll find *Wizards & Warriors* a little disappointing. With powerful graphics and processing now available, it's unfortunate this game doesn't take advantage of them. There is a huge world to get lost in, but unfortunately it's let down by substandard graphics and bad voice acting.



If you overlook these problems, *Wizards & Warriors* is good fun. If there's one thing the designers got right, it's the detailed background story. The game is set in a world called the Gael Serran, which for centuries has lived in peace. An ancient fight between Anephas, the priest of light, and Cet Ude D'ua Khan, the Lord of Death, was settled when Anephas cast a spell that would seal both of them away forever.

However, a lich with a desire for revenge has released Cet Ude D'ua Khan, accidentally destroying Anephas's body in the process. Evil is spreading, and only the legendary Mavin sword can kill Lord Cet. In customary fantasy game style, the Mavin sword is lost and it's up to you to find it, kill Cet and restore peace.

The rules and character classes are similar to AD&D. You can have up to six characters in your party at one time, including warriors, wizards, priests and thieves. As well as human, elf and dwarf races, there are other, more distinctive races to choose from, such as the tiger-like whiskahs.

Aside from the main mission, there are over 400 secondary quests and adventures to complete. The world is a very large one, and well worth exploring. If you're hankering for a first-person, fantasy RPG, *Wizards & Warriors* will whet your appetite, but APC recommends waiting for a better game.

Darren Ellis

Contact Activision

Phone (02) 9869 0955

Online www.activision.com/games/wizards

Price \$87.95

Requires Pentium II 233, Windows 95, 64M RAM

Classification G(8+)

Rating ■■■■■■■■

Combat Flight Simulator 2: WW II Pacific Theatre

This game will surely increase your respect for World War II fighter pilots. Flying two tonnes of metal in a tense combat situation is a darn hard thing to do. *Combat Flight Simulator 2* is Microsoft's latest game for simulation fanatics. It allows you to fly a series of missions as either a Japanese or American pilot in the South Pacific from 1943 to 1945.

Graphically, *Combat Flight Simulator 2* has a slight advantage over its predecessor, and all the planes are well modelled using the Flight Simulator

2000 engine. The horizon and landscapes also look great, but at times play can become a bit choppy (APC used a Pentium II 450MHz with an nVidia TNT2 graphics card) when banking sharply or attempting some aerial acrobatics. Another new feature is the 'virtual cockpit'. This replaces the standard flat 2D screen overlays with a 3D-rendered interior. It's a nice feature, but again, you need a top of the range system to take full advantage of it.

Most of the WWII fighting in the Pacific took place around small clusters of islands and along coastlines, so most missions in *Combat Flight Simulator 2* reflect this. Gameplay centres on dogfighting, bombing ground bases and taking out enemy ships. Missions are based on actual battles, and it's obvious that the game's creators have gone to great lengths

to be historically accurate.

Flight handling is great: getting shot in the right wing can produce a noticeable tilt in your flight-axis, which you can compensate for by pulling your joystick in the opposite direction (attempting to fly with aircraft damage is actually kind of fun). Also included (to the delight of *Combat Flight Simulator* fans) is a mission builder, which was used to create all the in-game levels.

Combat Flight Simulator 2 is a significant improvement on the original title. There has been a superficial attempt to make this title attractive to a wider audience, but it is still a hardcore simulation at heart. It might convert some new people to the genre, but it is (thankfully) still a game tailored to simulation fans.

Daniel Gardiner



Contact Microsoft

Phone 13 20 58

Online www.microsoft.com/games/combatfs2

Price \$99

Requires Pentium 266, Windows 95,

32M RAM

Classification G

Rating ■■■■■■■■

Gamespy

● Fans of Frank Herbert's *Dune* novels should be rejoicing this year, as a range of *Dune*-themed products will be released in the next 12 months. A six-hour miniseries based on the first novel recently aired in the US and received stunning ratings. Keep your fingers crossed, as it may come to Australia. Also, as reported in APC's December issue (page 194), Westwood is working on an unofficial sequel to its classic real time strategy game *Dune 2*, this time in 3D and entitled *Emperor: Battle for Dune*. If these prospects aren't enough, Dreamcatcher Interactive is creating a 3D action/adventure game hybrid built around the original *Dune* novel. Players adopt the role of Paul Atreides as he endeavours to prove himself to *Dune*'s desert people, the Fremen.

● In an interesting twist, troubled 3D card giant 3dfx has been bought out by its principal rival, nVidia. The purchase came hot on the heels of 3dfx's announcement that it would opt out of creating its own cards, and go back to its original strategy of supplying chipsets to third-party manufacturers. It seems that 3dfx was in more strife than first thought, and almost all its assets (including the 3dfx and Voodoo brand names, intellectual property and patents) were sold to nVidia



for \$US112 million. Many of 3dfx's US employees have been offered positions with nVidia, but most of its European operations have had their staff made redundant. 3dfx expects to finish official business by January 15th, and close its doors for the last time one month later. Questions remain as to what kind of hardware and driver support current 3dfx card owners will receive, but it looks grim; nVidia's plans for the business don't seem to extend to maintaining any of its previous agreements. The panic over the

Star Trek Voyager: Elite Force

This is the latest in a long line of computer games based on the *Star Trek* licence. Just about every other game produced with the *Star Trek* name has been deplorable. Once the precedent had been set, the *Star Trek* dross kept rolling out.

Despite the pre-release hype, *APC* wasn't expecting much from *Elite Force*. However, when we actually got our hands on the game we were pleasantly surprised. *Elite Force* is a first person shooter (FPS) set on the USS *Voyager*, and is based on the *Quake III* engine. You play Ensign Munro, a member of the new *Voyager* Hazard Team. *Voyager* and the Delta Quadrant are light-years away from Starfleet forces and their allies, so *Voyager*'s senior officers created the Hazard Team as a special unit to handle crises. Under the tutelage of Tuvok, the game begins with an away mission to a Borg cube. The Hazard Team has been imprisoned on the cube, and it's your job to rescue them. It may seem like a hefty mission to start the game with, but it is merely a teaser — the whole thing is a training simulation run on the ship's holodeck.

The real game begins just like a television episode — *Voyager* is hailed by an unknown ship in distress. When Captain Janeway investigates, the other ship suddenly comes to life and attacks. A short firefight results in the destruction of the enemy craft, but in its wake a wormhole opens and sucks *Voyager* to an unknown part of space full of derelict spacecraft. There's a dampening field around the area, preventing the ships from leaving. Some of the craft are ancient, and unless something is done quickly, *Voyager* may be stuck forever. Cue the intro sequence from the television series.

The game captures the look, sound and feel of a *Star Trek Voyager* episode exceptionally well. The design of the *Voyager* levels is very detailed and realistic — it's fun to walk around the floors soaking up the Trekkie atmosphere. All of the characters from the series feature in *Elite Force*, and although they don't play a large part in the game, you often run into Janeway, the HoloDoc, Seven of Nine and others.

Just like the television show, the game isn't all action. Between missions there are simple tasks to perform, such as meeting crewmates, testing new weapons in the

holodeck and attending briefings. This creates a sense of the everyday on *Voyager*, and it's fun to just walk around, checking out the design during these interludes.

There are nine weapons available throughout the game, each with a secondary firing mode. During most missions you're travelling with other members of the Hazard team. The non-player charac-



ter AI is not as poor as the AI in *Daikatana*, but it could use a little improvement. You might be shot in the back if you stray into their line of fire, but at least they know enough not to keep blasting away.

The packaging for *Elite Force* claims the game has 40 intense levels, but some of these are little more than hallways that you must navigate between cutscenes. The problem with the level design is that although the levels are pretty to look at, they are all extremely linear. There's really not much choice in the path you take to complete each mission. Some of the levels are quite exciting, particularly when *Voyager* gets invaded by bug-like aliens, but they all seem too short.

All up, *Star Trek Voyager: Elite Force* is an excellent game for die-hard Trekkies. Raven have done a good job of incorporating a first person shooter into the *Star Trek* universe without sacrificing the integral non-interference ethos.

Darren Ellis

Contact Activision
Phone (02) 9869 0955
Online www.ravensoft.com/eliteforce
Price \$87.95

Requires Pentium II 233, Windows 95/NT, 64M RAM
Classification G(8+)
Rating ■■■■■■■■

Age of Empires II: The Conquerors Expansion

This is a great extension to the Age of Empires series, which has gone from strength to strength with each new addition.

You need to have a full version of Age of Empires II: The Age of Kings to play The Conquerors, which adds five new civilisations and 11 new units. The Conquerors Expansion is not just an add-on; it redresses some of the problems of the original Age of Kings.

There are 26 new technologies. As well as new general technologies, every nationality has unique units and technologies to reflect its historical counterpart. This makes gameplay much more interesting, and painlessly adds to your knowledge of world history.

There are new modes of play: King of the Hill, Wonder Race, Defend the Wonder and Last Man Standing. You can now also choose the level of difficulty in campaigns.

The AI of villagers has been improved; the new auto-replant feature will be a relief to experienced players who have had to use precious resources to continually replant fields as the battle rages around them.

The Conquerors also features new maps, and new natural elements, such as



snow and jungle. You can now track the movements of your enemy by the trail they leave in the snow. The addition of these environments also means that there is now a greater variety of wildlife to manage.

If you are a fan of this series, the Conquerors Expansion is a must.

Paul Lipscombe

Contact Microsoft

Phone 13 20 58

Online www.microsoft.com/games/conquerors

Price \$54.95

Requires Pentium 166, Windows 95/NT, 32M RAM

Classification G(8+)

Rating ■■■■■■■■

Rainbow Six: Covert Operations Essentials

Anti-terrorist units are some of the military's best trained, as they must defuse intense situations with skill and precision. The Rainbow Six team is the cream of the anti-terrorist crop. As a member of this elite squad, you have access to training, weaponry and tactical data that has previously only been available to counter-strike units.

Rainbow Six: Covert Operations has a high level of detail, which includes a mass of technical data which you must read to survive the missions, and impressive environments for each mission. The optional training program is excellent. Some of the information could be applied to real situations.

There are nine new levels (six training levels and three full levels) co-designed by the Rainbow Six and Rogue Spear teams. Some of the original levels have also been included, but they have been improved to provide more atmosphere, which is a very important aspect of the game. This is a standalone game, so it doesn't require any previous versions of Rainbow Six.

Hardcore fans will find everything they've grown to love about the fran-



chise, plus more. Combined with single player and multiplayer missions, the training gives players an engrossing behind-the-scenes experience of the world of anti-terrorist operations.

Ryan Shaw

Contact Ubi Soft

Phone (02) 9362 1414

Online www.redstorm.com/covert_ops

Price \$87.95

Requires Pentium 266, Windows 95, 64M RAM

Classification MA(15+)

Rating ■■■■■■■■

sale of 3dfx has had ramifications for retail chains as well. Many shops in the US have removed 3dfx products from their shelves out of concern that they will not be supported come mid-February.

● A recent press release has revealed a disappointing fact about Microsoft's Xbox: it won't support DVD movie playback. Main rival PlayStation2 comes with standard movie playback, but the Xbox requires a separate add-on to access this much-coveted feature. Microsoft has given the lucrative contract to provide DVD decoding to Ravisent, which will use a version of its cross-platform DVD-drive program CineMaster to enable movie playback on the Xbox. Ravisent's senior vice-president Alan McCann suggested that a bundle (comprising the CineMaster software and a remote control) will be available for Xbox owners who are interested in this function.



● American McGee's new game Alice (a dark reworking of *Alice In Wonderland*) has been slated for conversion into a movie. McGee will co-produce with Dimension Films, and it will be directed by horror veteran Wes Craven (of *A Nightmare On Elm Street* and *Scream* fame). Don't hold your breath though; production is still in the early stages (with the script still in the works), so the release date is anyone's guess.



Best ever role-playing games

After a lull during the mid-1990s, RPGs are topping the gaming stakes once again. APC reviews the games behind this resurgence and the classics that inspired them.

Fallout



Released by Interplay in 1997, this game has you wandering post-apocalyptic wastelands inhabited by mutants, thugs, pimps, ghouls, giant rats and other unsavoury creatures. Fallout is legendary for its adult-oriented gameplay, gritty realism and black humour.

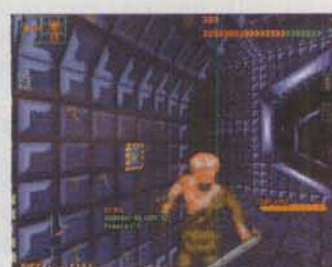
When it came out, it was one of only a few RPGs available. Its success helped reinvigorate the genre, paving the way for the release of more great titles.



System Shock



Created by Looking Glass Studios, System Shock is one of the most atmospheric and scary games of all time. The game casts you as a lone hacker marooned on a doomed spacestation overrun by an artificial intelligence named Shodan. Shodan has a God complex, and being hunted by this rogue AI through the dimly lit halls and passages of Citadel Station is so traumatic that some of us still sleep with our lights on.



The Elder Scrolls: Arena



Arguably the finest game to come from Bethesda Softworks, Arena is the first title in the Elder Scrolls series, which also features Daggerfall, Redguard, Battlespire and the forthcoming Morrowind. A 3D, first person RPG with a huge, open-ended structure, it was revolutionary when it was released. You can undertake the main quest or roam from town to town on minor quests. Arena's incredible magic system, many character classes and addictive gameplay made it an instant cult classic.



Baldur's Gate 2: Shadows of Amn



Baldur's Gate 2 is better than its predecessor in just about every respect: more quests, a stronger story-line, masses of items and more character generation options. Its sound and graphics have also been improved. There's support for 3D acceleration, which produces extra shiny spell effects, and there are atmospheric sound effects, such as echoes in caves and dungeons. The original story is continued, but this time you wander the nation of Amn, battling more deadly foes and facing evil once again.



Deus Ex



This intriguing hybrid of RPG and FPS from Ion Storm is a true work of art. It seamlessly combines conventional role-playing elements such as character advancement and nonplayer character interaction with fast-paced Matrix-style action gameplay. You can choose which skills you value most, such as hacking and weapons, and incorporate some hefty upgrades (such as the ability to run faster, jump higher or step silently) into your nanotechnology-augmented body.



Final Fantasy VII



This is the game that reinvigorated the rather stale console RPG genre. By PC standards, the graphics aren't exceptional, but they do tell the incredibly complex story-line very well. More than a few people have been known to be brought to tears by the conclusion of the first act of this huge saga. The PlayStation version of this game is far superior to the PC version; APC recommends you choose that.



Planescape: Torment



Another great RPG from Interplay and Black Isle Studios, Torment has you jumping from one world to another through dimensional gates. The haunting story-line is one of the finest APC has encountered in any RPG, and the game succeeds in creating a daunting yet engrossing atmosphere. You play the Nameless One, an immortal who is cursed to return to life while all those he loves pass on. Unlike other Black Isle Advance Dungeons & Dragons RPGs, you are restricted to playing the role of a specific character. However, you are given the opportunity to change class quite frequently. This means that you're not stuck with being a fighter or a thief if your preference is really to be a magic user.



Ultima IV: The Quest of the Avatar



Ultima I, II and III are good, but not great. However, Ultima IV is a revelation. It has a full, living, breathing world, an enormous quest, and a great magic system with the power to tempt players into beds of poisonous weeds on the off-chance of finding some Mandrake root. Ultima IV is so addictive at the time, that many players returned to it once finished, just so they could wander the landscape, revelling in their power and beating up lesser creatures that only the day before had them scurrying for the safety of the towns. Ultima IV introduced the concept of a full plot within a reasonably free-flowing world. You can say 'to hell with the consequences' and go around killing innocents, but you pay for this in the way nonplayer characters respond to you. Later Ultimas may look better, but none play as well as Ultima IV.



Secret of Mana (Super Nintendo)



This is the best action-based console RPG of all time. Why? It has a (still to be emulated) three-player simultaneous quest system, and a weapons layout that focuses on improving weapons and allowing characters to become more skilled in their use. It features a psychotic midget character, the opportunity to summon a dragon using only a bongo drum and some of the funkiest (and yet most repetitive) music ever heard on a console RPG. Plus it is the only non-Xena source of the word 'Chakram'. It is absolutely loaded with sickeningly cute Japanese graphics and provides an irresistible opportunity to beat up ducks in army helmets. Isn't that what we all want, deep down?



Wizardry VI: Bane of the Cosmic Forge



This is still seen by many as the definitive Wizardry title. Its winning combination of solid gameplay and well-balanced character building more than make up for its less than spectacular graphics. Like every great RPG, it is very sharply focused on exploration and combat, and it does it with style. The story-line in Wizardry VI has you scrambling to stop the Cosmic Forge (a magic pen capable of making whatever is written with it come true) from falling into evil hands. There's also good news for Wizardry fans: after a lull of almost eight years, Sir-Tech (maker of the previous titles) is currently in the process of creating Wizardry VIII, and from what we've seen, it looks to be another winner.



Thac0 +10

Ultima Underworld 1 and 2

Eye of the Beholder

Pool of Radiance

Betrayal at Krondor

Legend of Zelda: A Link to the Past



Like humping a Rust Monster

Stonekeep

Lands of Lore: Guardians of Destiny

Granstream Saga

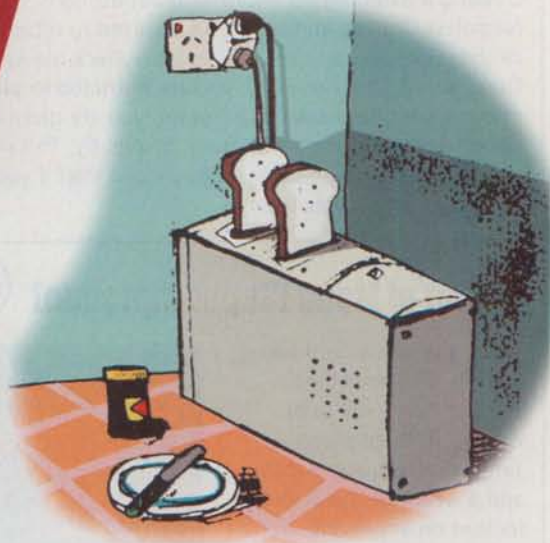
Myst/Riven

Descent to Undermountain

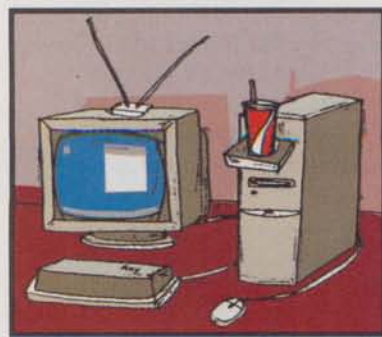


Mything you already

The IT industry has been responsible for more than its fair share of urban myths — plausible-sounding stories of stupidity or woe that, all too often, simply aren't true. **William Maher** casts a sceptical eye over some of the more persistent tales.



Where's the ANY key?



Think you've had some embarrassing moments with your PC? Helpdesk technicians get some truly weird queries, many of which have now become part of computer folklore. The most well-known story involves a new PC owner who rang a tech-support line about a broken 'coffee cup holder'. "That's no drink holder," said the telephone operator, "it's the CD drive." Hard to believe? Another PC owner was supposedly asked to return copies of defective disks to the manufacturer. Days later, a letter arrived filled with photocopied images of 3.5in floppy disks. Did it really happen? We're not so sure, but it's a great story.

Still more stupid user stories

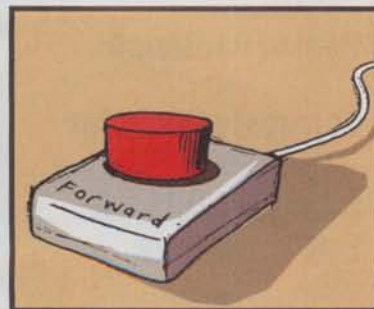
Back in the early '90s, university students claimed to have seen some very mysterious software errors, in particular "Drive C out of paper. Please insert paper in Drive C." Legend has it that the computer was rebooted and the message was never seen again. University students were also supposedly responsible for trying to fit 5.25in floppy disks into a 3.5in drive. When folding the disk didn't work, they trimmed the sides with scissors. Even more ludicrous is a popular story about the hapless PC owner who tried to

send a fax by holding the document up to the PC's screen and pressing Send. Sure, it sounds unlikely, but just ask any helpdesk worker and they'll tell you similar stories.

This message will self-destruct

'PC virus threatens millions!' Great headline, but the fact is, many virus threats are nothing more than hoaxes. The most infamous is the Good Times hoax, which appeared in 1994 and still refuses to go away. According to the myth, the Good Times virus can erase hard drives and in some cases even destroy processors. Victims receive a warning message about the 'virus', along with some helpful advice: "Forward this message to as many people as possible." And of course, everyone does. Even the creator of Good Times must be surprised by the reaction it caused, including a rash of copycat hoaxes.

Eventually, virus writers did create a real Good Times virus, but the original hoax has probably been more of a nuisance.



Gates gets generous

Bill Gates is giving away \$50 to every person who forwards a particular email message? An unlikely scenario, but one sent to thousands of email users in recent times. The story has it that Microsoft is testing email tracking software and wants to trace your email as you send it to friends and family around the world. Forward the message and you'll receive a nice cash bonus in the mail. Once again, many people fell for the trick, although it's hard to see how. Even if the cash bonus was real, do you think Bill Gates would really be involved personally in the scheme? The email was poorly written and the scheme would be impossible to implement. The message also advised you to forward the email to as many people as possible — always a good indication of something fishy.



They're charging for what?

Do you send a lot of email messages? Then you might be worried about the new email tax US authorities have apparently proposed. According to an urban legend, the US Postal Service is trying to recoup losses caused by email by charging five cents for each message. Under the scheme, anyone sending 10 emails a day would be up for about \$180 a year. Of course it's not true, but even New York political figures Hillary Clinton and Rick Lazio were heard on CNN arguing against the tax. There are other versions of the story, including one claiming that AOL is about to charge for instant messaging unless 100,000 people sign a petition against the plan. Yet



another version claims that Hotmail has run out of hard drive space and will delete the accounts of anyone who doesn't forward a particular message. Don't believe them.

Buy, buy, buy!

Think you can influence the stock market with a few well-placed emails? It's true, but you'll probably end up in jail. Last year, emails and bulletin board messages were posted online encouraging investors to look at Nasdaq-listed technology company Rentech. The messages claimed Rentech shares were about to skyrocket and were sent by an Australian man who earned a tidy profit from the scam. However, he was caught, found guilty of distributing false and misleading information and jailed. Even more daring, someone posted a fake press release warning that Lucent Technologies would not meet its earnings forecast. The result? The paper value of Lucent Technologies fell by an estimated \$US7.1 billion.



Mobile phone pranks

A popular myth that appears occasionally is that mobile phone owners can be tricked into giving others access to their account. The warning tells readers to hang up on anyone claiming to be a technician and asking phone owners to press 90# on their keypad. Pressing the keys supposedly gives people access to your telephone line and allows them to make long-distance calls charged to your account.



Telstra laid the matter (temporarily) to rest in October 1998, describing the rumour as an urban myth and saying that the scam had been checked "again and again". However, last year a variation on the rumour surfaced, this time claiming that mobile phones can detect police speed radar.

1800-MADAGASCAR-SEX

A year or two ago, a rumour emerged that people trawling the Internet had been fooled into downloading a 'dialler' or small piece of software that takes control of your modem.

The story went that surfers were none the wiser about the dialler which, once installed, was all but invisible to casual Net users. However, behind the scenes the cunning software supposedly turned down the modem volume so that calls weren't audible, then made extraordinarily expensive calls to overseas sex services. Needless to say, victims would receive a rather nasty shock on their next phone bill.



There is an element of truth to this rumour; a similar case arose with an Australian billing company last year when calls were diverted to either Madagascar or London. The lesson? Check carefully before installing anything you find on the Internet.

The big Internet spring clean

It's that time of the year again. Each year a warning appears telling naive Net users that the Internet must be shut down for 24 hours for spring cleaning. According to the urban myth, Net users should turn off Internet-connected servers and PCs so that data isn't deleted during the 'cleaning process'. Apparently the cleaning is done by five powerful Internet-crawling robots that search the Internet and delete any data they find, including broken hyperlinks and outdated sites. The result? A speedier Internet. If only it was that easy.



Fact and fiction

Find out more about digital crime and eBay, and join a clan of quasi-immortals.

Tangled Web: Tales of Digital Crime from the Shadows of Cyberspace

This is a great book for those interested in true stories of digital crime. Richard Powers takes a balanced stance and avoids the hype common in media reports on this subject. As a director of the Computer Security Institute of San Francisco, Powers is an authority on the subject.

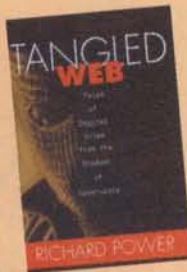
The book details many crimes, only some of which have been solved. Many statistics are quoted, but the estimates of the losses incurred due to cyber crimes compared with the meagre amount spent by companies on maintaining security are the most startling. Powers calls for more companies to come forward when attacked. He maintains that many attacks go unreported — or even worse, unnoticed.

Some of the stories Powers covers are extremely interesting. Take for example the disabling of AT&T in the early '90s (reported in the media as a software 'bug'), the tracking and arrest of Kevin Mitnick, and last year's ILOVEYOU virus. The book looks at both sides of digital crime: why these crimes are committed, and the work of the law enforcement agencies that monitor and track down the culprits. Powers also suggests preventative measures to protect businesses and homes from digital crime.

The book is a sobering read as it creates the impression that the Internet is crawling with hackers, crackers and phreakers committing crime after crime, and that it's just a matter of time before we all get attacked.

Darren Ellis

Author Richard Powers
Publisher QUE
Distributor Pearson
Phone (02) 9454 2222
Price \$49.95
ISBN 078972443
Rating ■■■■■■■■



The Computer Connection

To enjoy science fiction, you must first accept the story's key premise, no matter how implausible. There are two ways these premises function. They can work as enablers; for example, the nature of the *Star Trek* universe requires strange technologies, but the stories are about the human condition. Alternatively, the story can examine the effects of particular technological or evolutionary developments.

This book has not one, but two premises: the existence of a clan of quasi-immortals and the possibility of a human mind becoming spontaneously linked to a massive computer. They're not the core of the story, rather they allow the interplay of the characters. Bester's use of strange yet entertaining imagery, dialogue that blends English with a scattering of Spanish words, and

place names with corrupted phonetic spellings, means this isn't a quick and easy read, but it's no less engrossing for all that.

Before I read this book, Bester was not one of my favourite science fiction authors. However, this posthumous edition is a reminder that books don't need to be new to be worth reading, and that an author is sometimes worth revisiting.

Stephen Withers



Author Alfred Bester
Publisher ibooks
Contact Simon & Schuster
Phone (02) 9417 3255
Price \$21.80
ISBN 0671039016
Rating ■■■■■■■■

The ebay Phenomenon

This book claims to chronicle the birth and growth of eBay, the world's most popular online auction site. The subtitle, *Business Secrets Behind the World's Hottest Internet Company*, suggests that the book provides an inside look at what drives the business.

However, *The ebay Phenomenon* falls short of expectations. Authors David Bunnell and Richard Luecke admit that the executives of eBay did not wish to participate in the book, nor would employees agree to be interviewed. They also reveal they've never even been inside the corridors of the company. Instead, they rely on previously published interviews with executives, company press releases, and investor and stock exchange announcements.

The title also suggests the book would be an intriguing read for entrepreneurs, business managers, and anyone involved in a dot com company. It presents a lot of useful information, including mini case studies of people who have purchased

from eBay. However, these are mainly uninspiring; for example, there's the woman who bought her late brother's mandolin at an eBay auction, and

there's the man who auctioned a signed 1941 letter from Roosevelt's son for \$15.

The authors detail management theories that relate to the eBay story, but fail to successfully apply the theory. In any case, this approach isn't appropriate to the way the book is marketed: as "the compelling story behind" eBay. The verdict? Spend your \$46.40 elsewhere.

Cathie Kennedy



Authors David Bunnell with Richard Luecke
Publisher John Wiley & Sons
Contact John Wiley & Sons
Phone 1800 777 474
Price \$46.40
ISBN 0471384909
Rating ■■■■■■■■

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Cat. 2810 CardBus to USB \$179.00

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On track

pre_shrunk

With two bassists (Dave and Davage) and one drummer (Justin), pre_shrunk crank out some unusual tunes. The slightly askew line-up results in tracks that often refuse to fit neatly into a single genre, and the band is obviously not afraid of a little experimentation.

pre_shrunk have received praise in the Australian music scene ever since their formation in 1996, and the last two years in particular have seen an elevation of the band's public profile. Tracks such as 'Soundpimp' (dedicated to the corporate nature of the recording industry) from their 1998 EP 'Triple 'A' Sides' have received significant airplay on Triple J, and pre_shrunk has garnered many number of loyal fans and dedicated Web sites.

"We have a whole crew; 'soundpimps' we call 'em and they are very Net savvy. Our experience with them has been very positive. We find ourselves in constant contact with these fans. It helps us to hear the feedback and opinions of the 'soundpimps'; after all, it is they who support us most," Dave said.



pre_shrunk's music influences are varied. Their debut album, *Digital Sunrise*, features a range of songs, from fast-paced tracks such as '***gamer' (inspired by the popular computer game Half-Life) to more laid-back tunes like 'ring in sympathy'.

The band casts a wide net when it comes to collecting subject matter for their music. "We tend to jam a lot of ideas in... Most of our songs reflect experiences from our own lives. Sometimes lyrics come first, sometimes music. We are influenced by everything we hear and see," Dave said.

Dave, Justin and Davage are currently preparing for a 12-week tour beginning next month. The tour will promote the release of the band's *Digital Sunrise* album and will be entitled 'pre_shrunk 2001: a bass odyssey'.

Track ***gamer

Online www.preshrunk.com

The Jordans

The Jordans are a pair of guitar-toting Melbournites playing their own variety of acoustic pop. The band has existed sporadically and in various forms since 1989, but the current line-up consists of AD (Adam Dennis) and Shane Hill. Their 1997 debut album *Katydid* (which never saw widespread distribution) was created solely by AD.

Most song lyrics are still written by AD, but both band members compose the music jointly. According to AD, the foundations for their songs are often subconscious. "I'll be in the shower or putting out the rubbish when suddenly I



realise that there's a song playing in my head. If I'm quick enough, I can capture it on paper. The source of these ideas is rarely obvious at the time, but often I'll be able to see later that

the lyrics or chords related to something I heard or discussed recently."

The Jordans see the Internet as playing an integral part in the future of music. "We believe that people will buy albums in whatever format they're sold. MP3s will take the place of singles in the market and will become an important tool for new artists to get heard," they said.

They also believe that the online music revolution is resulting in a wider variety of music for listeners. "For years, we've had the situation where major labels have been able to effectively control what the buying public hears, but that's changing rapidly."

The band's second album, *The Hallelujah Mine*, is currently in the final stages of production and due for a February or March 2001 release.

Tracks Don't Go Out

I Fell In

Online www.thejordans.com.au



APC talks to four very different acts about the future of their music, and MP3s.

progress control

Michael Grammer has been composing house music (of the progressive and funky varieties) for about three years, but he's only been using the name 'progress control' for the last six months. Most of the music for progress control is created using programs such as T-raxx, Acid and Cubase VST. However, his introduction to the field was through Fast Tracker, a DOS-based tracking program which still plays a significant role in all his tracks. "Fast Tracker allows for a lot of spontaneity and experimentation, it's something you just don't get with many other programs," he said.

Composition is usually quite a drawn out procedure for a lot of progress con-

trol's songs. "The creative process is often long and painful. I'm usually working on about 20 or 30 tracks at the same time, and hop from one to another until one is completed. I've had some tracks sitting on my hard disk for two years and then all of a sudden a flash of inspiration hits and I finish them in an hour," Michael said.

Like the Jordans, Michael believes Internet distribution is changing the way music is approached and understood by listeners. "I think that the whole MP3 thing is a double-edged sword. It is great for up-and-coming artists who can distribute their music cheaply and efficiently, and thus make a name for themselves with little hassle, but it can also take away from the relationship which an audience has with an artist. The music becomes disposable because it is so easily accessible."

A progress control album is currently in the works, and Michael is also organising a recording label (Progress) and a home

recording studio to get his own and other groups' music into the hands of the public.

Atone video

The February videoclip is from Atone, one of the artists featured in the Clan Analogue special in last month's issue. 'Hole in My Shoe' is a laid-back number, with a nice mystical seaside motif.



All these tracks and the videoclip featured in Random Notes can be found on CD 1 of this month's cover CD pack, along with profiles of the artists.

Tracks Smooth Operator

Space

Online www.mp3.com/progresscontrol

Disco Stu

Ian Andrews has been creating digital music for almost 20 years. His early forays into electronic music were conducted in a range of guises such as Hypnoblob, and as part of the group Non Bossy Posse, and have earned him quite a reputation in his hometown of Sydney.

Disco Stu is his latest musical incarnation, offering a musical style which is 'a step backwards to the minimalism of his earlier work'. The tracks have a sinuous funky-house feel interspersed with a plethora of unusual samples; for example, 'Englishman in Ibiza' features some quirky retro Spanish lessons, from around the 1970s. The result is an eclectic array of songs that are brought together by their glossy production and very smooth finish.

Ian has an interesting philosophy when it comes to music creation. "I don't believe in the romantic notion of music as a pure force of expression coming from within," he said. "For me, music is a response to a combination of juxtaposed sounds, ideas, influences and acci-

DISCO STU: ADULT THEMES



dents. It's not like I get a song in my head which then must be realised. It's more a matter of grabbing a few sounds that I think will work together and trying different combinations of rhythms and arrangements until something really stands out. I'm always hoping for that happy accident."

He also has mixed feelings about MP3s. "It is positive in the sense that it provides a forum for interesting music which might not be heard elsewhere. Also, I think anything which sidesteps the excessive profit motive in the record industry is good. On the other hand, the MP3 phenomenon could be negative if it impinges on the market of the smallest record labels, forcing them to cease their activities by putting them into a position where they can't sell enough product to break even, or even come close to breaking even."

Disco Stu's first album, *Adult Themes*, is available through Clan Analogue Recordings (www.clananalogue.org). A second LP, *diamond suture*, is distributed in Germany by Cyclotron Records and is available as an import.

Daniel Gardiner

Tracks Disco Asylum

Gravity

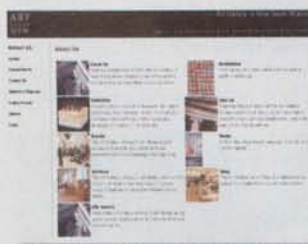
Online www.clananalogue.org

A fine art

With so many world-famous galleries now on the Net, you can sit back and admire the great works without leaving your living room. How well have these galleries been adapted for the Web? Take a tour and decide for yourself.

Art Gallery of NSW

The AGNSW holds about 35,000 art works, but this site carries only a few samples from the gallery's permanent collections. If you are keen on seeing paintings by Aboriginal and Torres



Straight Islander artists you may be disappointed with the range on display (only three). Accessing information on current and past exhibitions is easy, but the Gallery Shop is under construction, so you can't purchase any books, posters

or exhibition merchandise online.

Howard Dahdah

Online www.artgallery.nsw.gov.au

Rating ■■■■■■■■

The Art of China

This site provides a taste of several aspects of Chinese art and culture. The art component includes decorated vessels, crafts, painting and calligraphy, with pictures and information on each style. There are links to scholarly sites, to sites where you can buy books on Chinese art online, and to the Indianapolis Museum of Art, which has a Chinese collection. The site was last updated in 1997, but most links still work and the information on the artworks is



Online pasture.ecn.purdue.edu/~agenhtml/agenmc/china/china.html

Rating ■■■■■■■■

unlikely to have changed.

Megan Smith

Guggenheim Museums

This URL is a portal to the Guggenheim galleries in New York, Bilbao, Venice and Berlin, and to the Virtual Museum. Each gallery has its own Web site and the style of each one is different.



Guggenheim.ORG

They are disappointing if you actually want to view art as there aren't many works on show, but information about the physical galleries, exhibitions and art movements is plentiful. The Virtual Museum has been under construction for three years and is still nothing more than an explanatory page.

Megan Smith

Online www.guggenheim.org

Rating ■■■■■■■■

Gustav Klimt Art Gallery

Gustav Klimt began working in the late 19th century, but his art is surprisingly funky. Alas, the same cannot be said of this Web site. The first disappointment is that the home page is



extremely slow to load due to the inclusion of 55K of images, a survey form and a hit counter. There are several broken links. The first one, perhaps deservedly, links to the Webmaster's personal site. A good gallery, but not much information.

Online www2.magma.com/~alexxi/klimt/1klimt.htm

Rating ■■■■■■■■

Nola Camden

Louisiana Museum of Modern Art

Located on the windswept Baltic coast north of Copenhagen, the Louisiana Museum of Modern Art is a showpiece of Danish design. The Web site is more of the same: a stylish display of the gallery's collection with Giacometti sculptures among the highlights. The only thing missing from this eye-catching site is how the gallery got its name. Something to do with the founder's two ex-wives if I remember correctly . . .



Online www.louisiana.dk/dansk

Rating ■■■■■■■■

Heidi Smith

The Louvre

Finding Leonardo da Vinci's *La Gioconda* (Mona Lisa) online is not as much fun as doing it in the flesh, but at least you don't have to stand on your tippy toes behind a crowd 10 deep to



admire her. Accessing the major art works in the gallery's collection through this site is easy. Take care though, viewing such great works as Eugène Delacroix's *Liberty Leading the People* and the classic sculpture of the Venus de Milo could make buying an airline ticket to Paris irresistible.

Online www.louvre.fr

Rating ■■■■■■■■

Howard Dahdah

Henri Matisse Art Gallery

This site is little more than an extensive catalogue of the great Fauvist's works. You can find out a little about Matisse, but you need to follow the WebMuseum link for in-depth information. The works on the site are listed alphabetically, and by clicking on the name you can bring up a good-sized image. This is



Online www.geocities.com/Paris/LeftBank/4208

Rating ■■■■■■■■

particularly good if you are unfamiliar with Matisse's work or want to identify a particular painting. There are links to sites where you can purchase Matisse prints, but they are all overseas and an order would attract a hefty postal fee.

Gail Lipscombe

National Gallery of Australia

Transferring Australia's premiere art collection onto the Web has been a mammoth endeavour for the National Gallery of Australia. Despite more than three years under construction, the site is still not complete. To make the most of your online visit to the gallery, bypass the unwieldy 60-item menu page and go straight to the search function. Many of the works are under copyright and are not pictured, but the site still displays a substantial portion of the gallery's more than 90,000 works.



Online www.nga.gov.au

Rating ■■■■■■■■

Fiona Angus

The Museum of Modern Art

The Museum of Modern Art (MoMA), New York, was founded in 1929 by three artists determined to make art available to the masses. Seventy years later the vision remains intact, although the museum's reach is now geographically far larger. Along with



Online www.moma.org

Rating ■■■■■■■■

general information and samples from exhibits spanning the six main artistic genres (architecture and design, drawings, film and video, painting and sculpture, photography, and prints and illustrated books), MoMA also features a good collection of educational resources.

March Stepnik

State Hermitage Museum

This attractive site provides a tantalising glimpse into the Hermitage's large and diverse collection. Located in St Petersburg, the museum possesses over 3 million items, some dating from the Stone Age. Works by da Vinci, Raphael, Titian and Michelangelo can be viewed, along with highlights from collections including Oriental art, prehistoric art and numismatics. The calendar is still in development, but there are news items and exhibition details for those who want to feel they're really there.



Online www.hermitagemuseum.org

Rating ■■■■■■■■

Suzanne Fraser

The Vincent van Gogh Gallery

With over 5,000 works on display, the Vincent van Gogh Gallery displays every painting, drawing or letter ever produced by the tragic artist. Maintained by mad van Gogh enthusiast David Brooks, the site receives over 150,000 visitors each



Online www.vangoghgallery.com

Rating ■■■■■■■■

month. This is strictly an amateur affair, so be prepared for Brooks's tendency to subject the great works to photo-editing software. He also provides commentary, historical details, information on upcoming events and forums on Van Gogh.

Fiona Angus

The Andy Warhol Museum

Blurring the line between art gallery and museum, this site is as unconventional as its subject. Visitors are invited to "shop" the site to construct their own Andy Warhol, in the much the same way as he browsed modern culture for his inspiration. You can



Online www.warhol.org

Rating ■■■■■■■■

glimpse something of the man through his work and through those who knew him best. The site is excellent but the museum's real treasures, which include a massive archive of Warhol's personal memorabilia, ephemera, videos and films, cannot be accessed online.

Gail Lipscombe

Be my techno valentine

Before you know it, February 14 will be with us once again. If you're looking for a Valentine's Day celebration with a technological flavour, here are some handy hints from our guest panel of romance experts.

Miranda Dudley, 32, and Mike Smithton, 34, computer programmers

"During Valentine's Day, we'll be constantly sending each other instant messages, electronic postcards, and screensavers featuring the phrase 'You're my snooky ooky lover chum'. We'll also be setting up a special Web site to celebrate our unique bond at www.wearesopathetic.com."



Lucy the love-struck labrador, 3, loyal companion

"I get so frisky around Valentine's Day my owner had to buy me this nose cone. But if you want to add a little friskiness to your love life this Valentine's Day, why not get your life partner to try licking the terminals on a 9-volt battery?"



Silicon Valleys, 26, drag queen

"If you're alone and depressed on Valentine's Day, don't assume that your life is about as useful as a copy of Windows 3.1 on floppy disk. Just log onto EverQuest and slaughter a few assorted minions while wearing unfeasibly high heels. That'll show 'em."



Ronald Storkley, 45, e-trepreneur

"I'm going to be so busy ramping up my investments in a range of highly exciting dot com companies, which will entirely transform the global economy as we know it, that I'll barely have time to speak to my wife. Oh sorry, I thought this was February 2000."



Ethel Preston, 64, rooster handler

"Who needs love anyway? My memories of my wild past with Larry Ellison are more than enough for me. Now, I'm happy just spending my days upgrading my Linux kernel and waiting for someone to come and finally install my second phone line. Oh, and fondling this rooster."



Jorge Bennett, 36 and Rick Trees, 34, laptop service team

"Don't let unreliable equipment thwart your eromance plans! If you don't make sure your system is serviced regularly, your attempts to spam 5 million strangers with a last-ditch plea for love could go entirely awry."

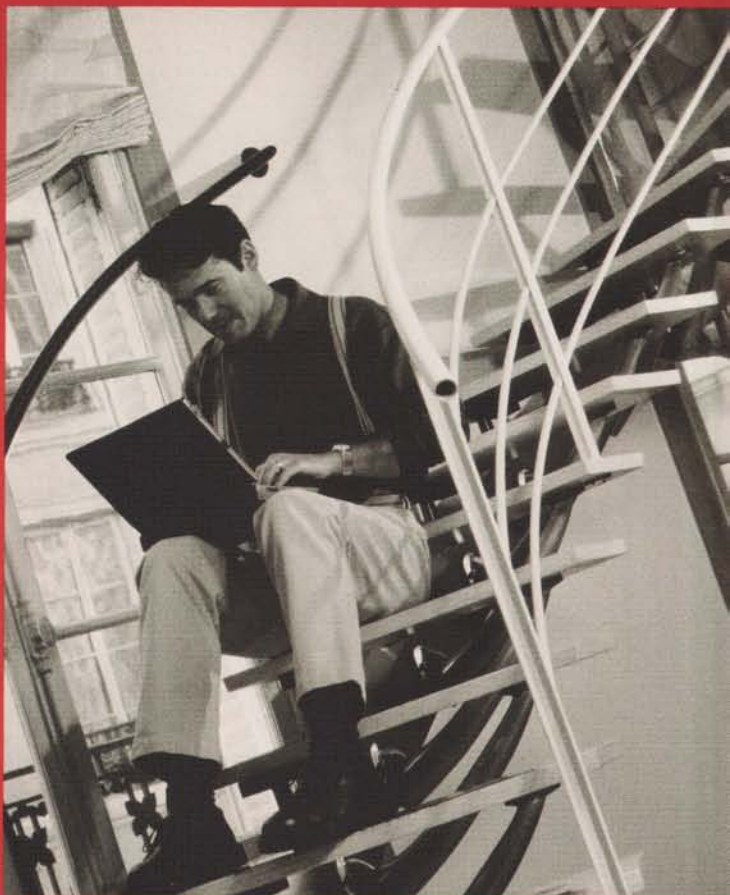
(Ed note: Excessive use of a notebook PC in bed may result in premature hair loss.)





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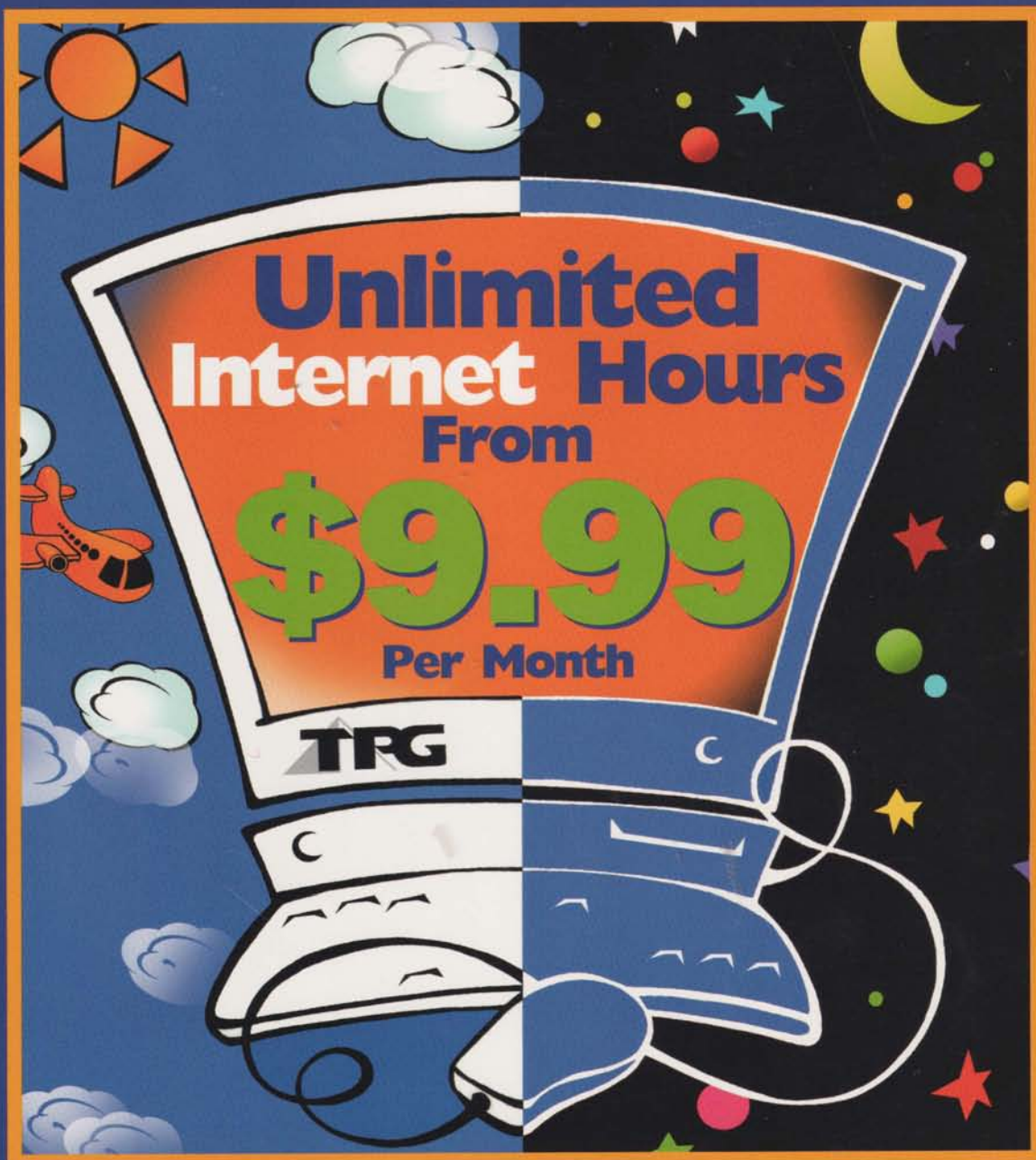
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